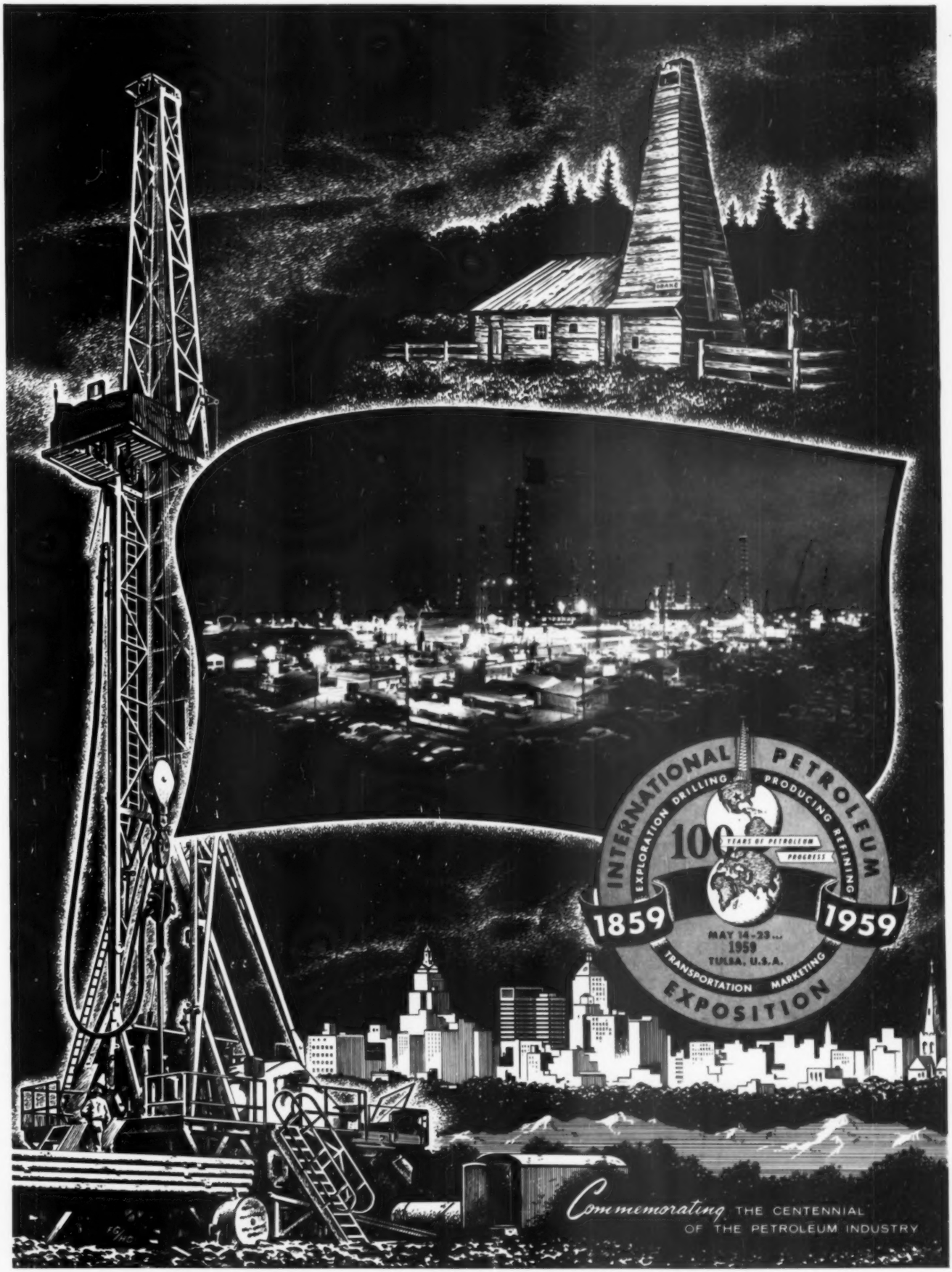
WORLD PETROLEUM

FEBRUARY 1959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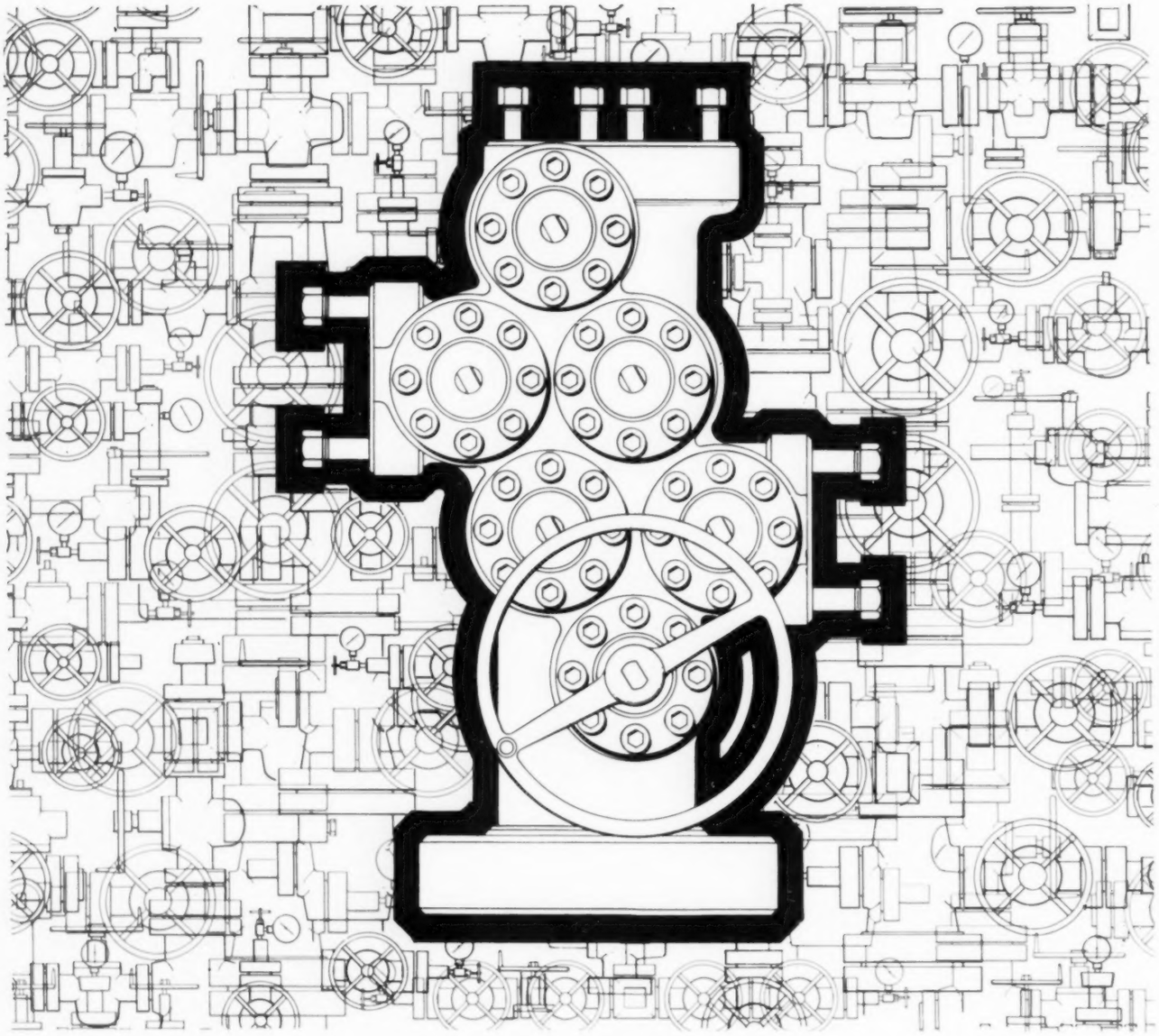

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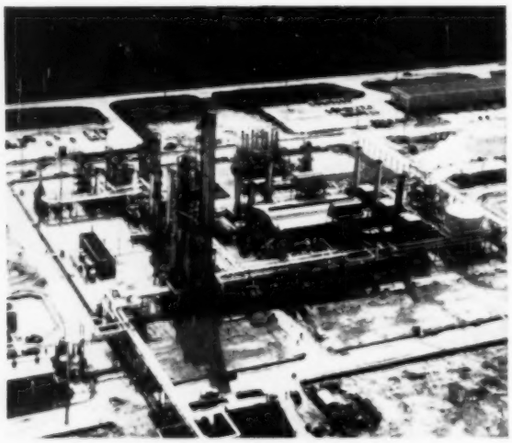

Petroleum Chemicals, Inc. new ethylene plant at Lake Charles, Louisiana is now on stream. Initial ethylene product capacity is 600,000 lbs per day but Lummus has designed the plant for rapid expansion to a rate of 900,000 lbs per day. Ethylene will be produced in two grades – the highest grade is 99.7% assay and the other grade 98%. Co-products will be high assay propylene, a butane-butylene fraction and aromatic distillate. Operations have been marked by continuous production of specification high assay ethylene under widely varying rates and feed stock compositions.

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World Petroleum

THE MANAGEMENT PUBLICATION OF THE INTERNATIONAL PETROLEUM INDUSTRY

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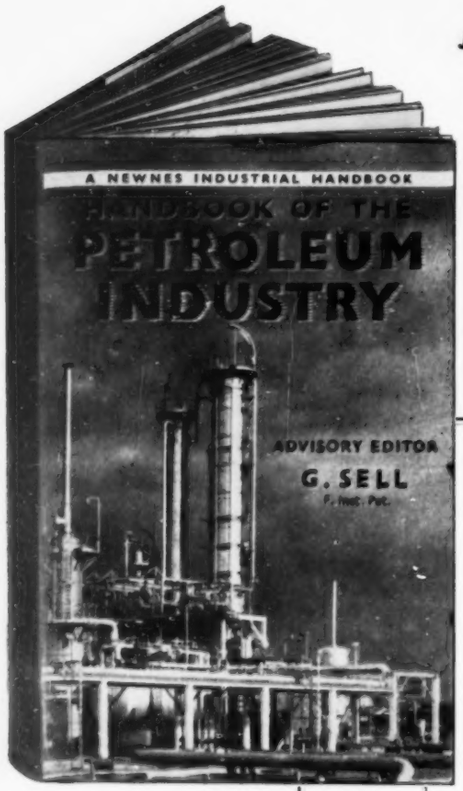

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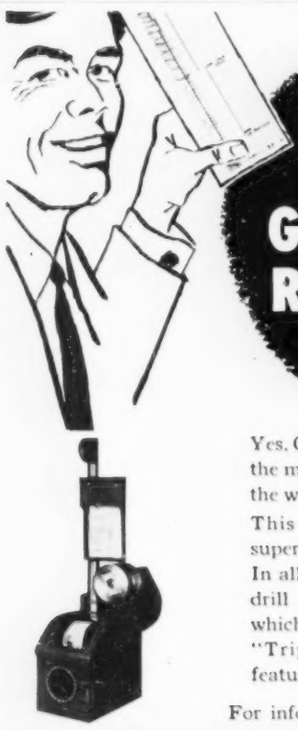

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By Joseph B. Huttlinger

Petroleum refineries plan to spend $468 million for new plant and equipment during the first quarter of 1959, according to a government report, compared with $645 million and $587 million, respectively, in the fourth and first quarter of 1958, and $728 million in the first quarter of 1957. Figures apply to plants producing products of petroleum and coal, but represent primarily oil-refinery spending. The report said this type of spending has suffered "the most severe cutback—about one-third" from 1957 to 1958, but that "first-quarter programs of these companies show a firmer tone."

Petroleum Council Changes

Secretary of the Interior Fred A. Seaton has named 102 oil- and gas-industry leaders to serve on the National Petroleum Council during 1959. In letters appointing the members, he urged them to adopt proposed changes in rules of organization to conform to his suggestions, as modified in talks with Chairman Walter S. Hallanan and other council leaders.

Chairman Hallanan called a meeting of the council for January 27, 1959, at the Sheraton-Carlton Hotel in Washington. This marked the first time the council was to meet on other than government property since it began operations 12 years ago. It was the first meeting of the council since October 1957, as a dispute as to rules of operation blocked any meetings during 1958.

Seaton said the proposed rule changes for the council include these: (1) provision for appointment of full-time salaried officials of Interior Department as council co-chairman and its committee chairmen; (2) procedures for appointment of members to committees and subcommittees and conduct of these meetings; (3) preparation and custody of minutes of meetings; (4) call of meetings and preparation of agenda for meetings.

By and large, the 102 persons named have been members in the past, with changes largely limited to succession of new persons as heads of companies or of associations usually represented on the council. For example, Albert L. Nickerson, Socony Mobil president, is a member replacing B. Brewster Jennings of Socony. And Frank O. Prior, chairman of Standard of Indiana, is a member replacing Dr. Robert E. Wilson.

Depletion Vicissitudes

Ernest Gruening, Democratic Senator-elect from Alaska, startled the petroleum industry with a press-conference statement in favor of slashing oil's depletion provision for income-tax purposes: "I have a feeling it should be reduced," he said in December. "I can't say by how much." He added "I don't think a cut would hurt oil development in Alaska." He regards the depletion provision as "a special form" of tax benefit, adding "there is some question if it is equitable."

Pipeline

An official of the Western Oil and Gas Assn. queried the Senator-elect whether he had been quoted correctly. Gruening said "yes," but commented that maybe Alaska is a special case so that any slash in the rate of depletion should not apply there. A. C. Rubel, Union Oil president, commented that a reduction in the depletion rate not only would reduce oil exploration in Alaska but "could well eliminate it entirely." Union Oil, with Ohio Oil Co., holds leases covering more than 500,000 acres in Alaska.

"In my opinion, if the Senator wishes to deliberately discourage oil exploration in Alaska—and I am sure he does not—he could choose no better course of action than to reduce the depletion provision," Mr. Rubel said.

Two other senators recently joined the forces urging a slash in oil's depletion provision. They are Senator-elect Stephen M. Young (D., Ohio) and Senator Joseph Clark (D., Penna). Young said he owns some oil and gas stocks, but that when he was a member of the House Ways and Means Committee in 1951, he voted to slash the allowance to 15%. He added that perhaps an even steeper slash is appropriate today. Young defeated Senator John Bricker (R., Ohio) last November.

US Treasury Department, meanwhile, promised "earnest consideration" to a suggestion that it recommend a reduction in the income-tax depletion provision for crude-oil and natural-gas production. David A. Lindsay, assistant to the Secretary of the Treasury, said the department is "continuing to study" the depletion provision. Lindsay wrote his views to Paul E. Hadlick, counsel for National Oil Marketers Assn. Hadlick had written Treasury Secretary Robert B. Anderson that the association had adopted a resolution asking a cut in the depletion rate. Lindsay replied: "The present 27.5% rate for oil and gas wells has been in the tax law since 1926 when producers of crude petroleum were first given percentage depletion. The rate has been consistently used since 1926, and has come to be reflected in many practices and valuations employed in the oil and gas industry. Consideration of a change would, therefore, call for careful consideration of all its consequences."

Gas-Tax Fight

An all-out fight over federal taxes on gasoline became certain in December when President Eisenhower announced he would ask Congress to raise the gasoline excise tax from the present level of three cents a gallon. Highway users and the petroleum industry at once said an increase is unjustified. The President did not say how much he wanted the tax raised, but the details were due in his budget message to Congress during January. Speculation was that he would ask an increase of one to two cents a gallon.

"The budget will request increased receipts from higher postage rates and gasoline taxes, and some new user charges for government services, but will not call for general tax increases," the President said.

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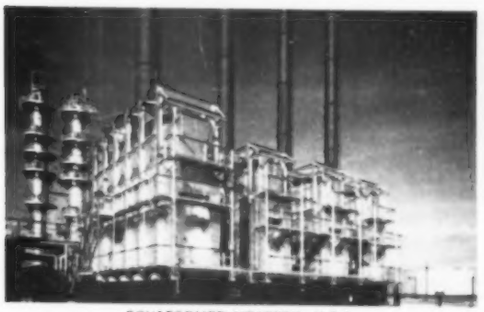

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Each penny of federal taxes on gasoline brings the US Treasury more than half a billion dollars in revenue, it is estimated. The extra gasoline tax, it is explained, is needed because of an expected deficit in the highway trust fund.

Frank M. Porter, API president, stated that, if all the taxes on highway users went into the trust fund, there would be no deficit. Mr. Porter pointed out that, in the fiscal year ended June 30, 1958, the federal government collected $3.6 billion from special taxes on motorists. Of that, he said, $2.1 billion was allocated to the highway trust fund, while the remaining $1.5 billion went into the general fund of the US Treasury. With the states collecting an average of six cents a gallon, he said, there is a "luxury tax of 42% on every gallon of gasoline sold."

At the capitol, close study of the proposed increase was promised, amid predictions that it's 50-50 whether the Congress will go along with the President's request. Senator Mike Mansfield (D., Mont.) expressed doubts that Congress would add another cent to the gasoline excise tax. Representative Clarence Cannon (D., Mo.), chairman of the House Appropriations Committee, saw a chance Congress would agree.

Against Canadian Import Curbs

A special two-man committee of the US House of Representatives called upon the USA to end import curbs on oil from Canada. The committee said "the net effect is detrimental to the interests of US and its government," and "consequently, we recommend the abolition of the oil-import quota system, at least insofar as Canada is concerned, in order to better serve our defense and foreign policy needs."

The report was by two members of the House Foreign Affairs committee—Representatives Brooks Hays (D., Ark.) and Frank M. Coffin (D., Me.). Hays, defeated last November, was not back in the Congress which opened January 7. The report is the second from the two, and follows a visit to Canada in September and October.

The two-man study mission also suggested that USA make "comprehensive studies" of the "probable extent of usable oil reserves in the Western Hemisphere." The report was issued about the time the USA announced a two-month extension of the present quotas to companies to import crude oil and unfinished gasoline and other oils. The delay indicated US officials were having trouble agreeing on a revision of the program, originally planned to take effect January 1, 1959. The two men agree the plan on the present voluntary basis is bad for relations between the USA and Canada, and added that "mandatory controls are certain to aggravate the situation."

The report pointed out that Canada is considering an uneconomical oil pipeline from the West to Montreal which would raise prices to Canadian consumers and further cut into the export markets for oil of Venezuela. "If oil is needed for defense," the report said, "there is no legitimate distinction between the wells of North Dakota and Texas on the one hand, and the wells of Alberta and Saskatchewan on the other. "All is available to meet any threat posed to the people of the USA and of Canada. As far as the defense situation is concerned, the Canadian border is nonexistent. By this we mean that such oil as is available on the North American continent is equally available for the defense of that continent. "It is spurious reasoning to argue that reserves in Texas would be available to meet an aggressive threat while those of Canada would not be available. Indeed, we feel that our oil policies should reflect to a greater extent than they have the 'insurance policy' aspect of oil reserves in the North American continent and in the entire Western Hemisphere. The geographical and political vulnerability of the Middle East would seem to dictate such an approach. Given such an orientation, we are optimistic about the oil-supplying potential of Canada, the USA—including Alaska, Mexico, Venezuela, Bolivia, Peru, Ecuador, Brazil, and Argentina. The potential in this area has been perhaps half explored. The implications of this unexplored potential should be of vital importance in free world planning."

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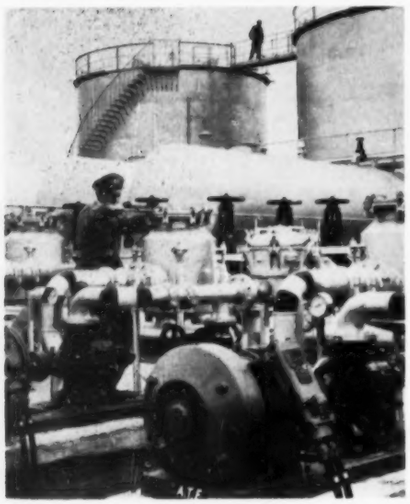
LONDON LETTER

By Cecil W. Wood



Pipeline Fueling At Airport

Shell-Mex and BP is seeking parliamentary sanction for two 6-in. 8-mile pipelines to deliver aviation fuel from its Walton-on-Thames depot to London Airport, where it claims to fuel four out of every five airliners. This was foreshadowed by C. M. Vignoles, its managing director, at the recent opening of Perry Oaks storage installation, one of the three now completed in and around the airport with a total capacity of $1\frac{1}{2}$ million gallons. These three conclude the first phase of the company's airport plans, which include 6,000-gal fueling tankers with 10,000-gal vehicles on order. It was also the first to install a system of radio-controlled vehicles to speed up such fueling operations.

Speaking of the future, Mr. Vignoles said turbine-fuel offtake passed that of aviation gasoline in 1955 and is rising steeply. The big superjet now coming into service will take 15,000 gal at one fueling. By 1962, jet-fuel demand at London Airport is expected to be double today's offtake and by 1966 more than trebled. To meet this would need at least 150 4,000-gal bridging tankers every day in the summer, with attendant road-traffic congestion both inside and outside the airport. The obvious solution would be to replenish the main storage tankers by pipeline.

Holyhead As A Major Port

A private bill lodged in parliament seeks powers for the British Transport Commission whereby it can develop Holyhead harbor into a major oil port for large tankers. This was originally constructed as a "harbor of refuge," and is not adapted for commercial use; for example, although the outer harbor can take the largest tankers at any state of the tide, there are no facilities for their berthing or discharging. The commission proposes to provide these as the importation of crude and refined oils is under consideration by "important industrial interests." Prior to the lodging of this bill, reports had connected the names of Shell and Tidewater with major developments in this area, and there was reference to the possible building of a "large refinery," but no firm information is available so far.

Oil-Equipment Standardization

The Oil Companies Materials Assn. (OCMA) has been registered in London as a company limited by guarantee to assist its members—initially limited to 50—to formulate and promote a common policy, through the British Standards Institution, for the standardization and specification of materials and equipment used in the petroleum industry. It will also publish data on the nature and usage of such materials. Standardization of petroleum and products also comes within its orbit. The initial member-companies and those signing are: Apex (Trinidad)—L. A. Bushe; Attock Oil—J. Mitchell; British Petroleum—Thos. MacDonald; Burmah Oil—S. W. Eavis; Esso Petroleum—George G. Popham; Iranian Oil Services—H. W. Ridgen; Lobitos Oilfields—R. E. Douglas; Mobil Oil—R. A. Williams; Shell Petroleum—W. E. Madden; and Trinoil (UK)—J. A. Lindsay. The manager is W. E. Madden, and the secretary H. J. Lambert. Offices are at Cecil Chambers, 86 Strand, London, W.C.2.

OCMA can be considered as the formal constitution of the Oil Companies Materials Committee, a wartime body originally which has since been concerned with equipment standardization in cooperation with the Council of British Manufacturers of Petroleum Equipment: It has also issued quarterly classified statistics of material and equipment orders placed in the U.K. These will continue to be issued by OCMA on the same basis.

At a farewell luncheon given to R. C. H. Toye, OCMC chairman for several years past, he spoke of the three "S's" of the British Standards Institution—specification, standardization, and simplification—and suggested a fourth, scheduling, to cover uniformity in cataloging and material costing. Between countries, he urged full support for the work of the International Standards Organization, and stressed the great importance of developing contacts with the American Petroleum Institute.

Diesel Fuels At High Altitudes

In few countries is the effect of altitude on diesel fuel so important as in South Africa, where it is estimated some 42% of users are over 5,000 ft above sea level. A study of this effect is now being made by Shell under the supervision of G. Phillips, head of the technical department in Cape Town. His mobile "test bench" is a 1958 Dodge Kingsway saloon fitted with a 4-cylinder P4(c) Perkins diesel capable of developing 58.5 bhp at 3,000 rpm. An overdrive has raised the top speed of the saloon to over 80 mph.

W. K. McGavin

Shell Chemical Appointments

W. K. McGavin has been appointed manufacturing director of Shell Chemical Co., following the retirement of F. Mackley. Mr. McGavin has held a number of overseas appointments with Shell, the last one as refinery manager at Suez.

Other appointments on the manufacturing side include Dr. J. L. Edgar, manager, manufacturing operations department; J. O. Dugdale Bradley, manager, engineering department; and L. Holliday, manager, technological department. At the company's chemical plants, R. W. Lerrigo and E. J. Dawson become chemical plant managers at Stanlow and Shell Haven, respectively. At the Partington works, W. E. Huggett, general manager, will be assisted by an administrative manager, F. W. A. Paterson, and an operations manager, H. L. Sturgess.

New Kuwait Managing Director

Kuwait Oil Co., in which Gulf Oil Corp. has a 50% interest, released the following statement in London for first use December 30, 1958:

"Sir Philip Southwell has reached normal retiring age and is relinquishing the position of managing director of the Kuwait Oil Co. Ltd., on June 30, 1959. He will remain as a director of the company, but will be succeeded as managing director by the Honorable William Fraser who has been appointed an assistant managing director of the Kuwait Oil Co. Ltd., as from January 1, 1959. Sir William has been on the staff of the British Petroleum Co. Ltd. since 1950. Only son of Lord Strathalmond, he was born in 1916, educated at Loretto School and Clare College, Cambridge; barrister at Law (Lincoln's Inn and Inner Temple) 1946-1950; Army service, 1939-1945.

H. C. Tett

Tett Esso's New Chairman

Esso Petroleum Co. Ltd., UK refining and marketing affiliate of Standard Oil Co. (N.J.), has announced election of H. C. Tett as chairman and managing director to succeed Sir Leonard Sinclair, who retired after 50 years with the organization.

Since 1957 a managing director and chief executive of Esso Petroleum Co., Mr. Tett joined the company in 1928. In 1939 he transferred to International Assn. (Petroleum Industry) Ltd., engaged in coordination of technical matters relating to sales throughout Europe for Esso organization. From 1947 to 1949 he was managing director of Esso Development Co., and thereupon became general sales manager of Esso Petroleum Co. In 1951 he was appointed a director of the latter; in 1956 he became a managing director, and in 1957 assumed duties of chief executive.

Diesels For British Railways

There is to be an acceleration of the introduction of diesel locomotives, particularly on the railway routes north of Newcastle, in order to eliminate the use of steam on an area basis as quickly as possible. This was announced in parliament, December 12, by the Minister of Transport, when a bill passed its second reading giving the British Transport Commission power to borrow an extra £600 million. The minister added that the government had already authorized an increase in capital expenditure in 1959 to speed up the purchase of main-line diesel locomotives, and by 1961 nearly 1,100 of these would be in service.

Gulf Purchasing Transfer

A further Gulf consolidation in London is seen in the announcement that Gulf European Co.'s purchasing department has been transferred from Paris to 2 Portman Street, London, W.1. Purchasing activities will continue to be performed under the direction of E. Q. Olson.

Halliburton Subsidiary

Halliburton Ltd. has been registered by Halliburton Oil Well Cementing Co., of Duncan, Okla., as a British company, with the object of rendering more efficient services outside the USA and to integrate more closely the group's activities in Europe and other Eastern Hemisphere areas. Offices have been established at 23-25 Maddox Street, London, W.1, with John C. Padgett as managing director and Erwin Kaltwasser as deputy manager. Arrangements are under consideration for the establishment of a plant in the UK to manufacture equipment and assemble oil-field tools, but this will not disturb existing manufacturing licenses granted by Halliburton in England, France, and Germany. The other directors of Halliburton Ltd. (all executives of

INTERNATIONAL TD-20

new 134 hp. crawler with Drott 4-in-1 multiplies job range by four

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The work capacity of the new TD-20 is amazing—up to 50% increase! It's the result of an exclusive combination of 134 diesel horsepower teamed with a fast, full reverse, 6-speed transmission, plus 109-inch track stability.

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Measure exclusive International TD-20 Drott 4-in-1 advantages like single-motion speed and direction control (up to 8.4 mph. reverse), 13-foot dumping clearance, 43,150 lbs. break-out force and shock-absorbing Hydro-Spring. See your International Construction Equipment dealer for complete details.

INTERNATIONAL HARVESTER EXPORT CO., 180 N. MICHIGAN AVENUE, CHICAGO 1, ILLINOIS, U.S.A.

Halliburton Oil Well Cementing Co.) are L. B. Meaders (president), R. C. Kelly (vice president) R. R. Emery (vice president for foreign operations and export sales), and J. P. Harbin (controller and assistant secretary).

Candle Plant Re-Equipped

The Battersea plant of Price's Patent Candle Co. has been formally re-opened following the completion of a £250,000 reconstruction and re-equipment scheme. It is now the biggest of its kind in the UK, and includes a feature not to be found elsewhere in the industry, the extrusion section, based upon a production method introduced after seven years of research. This technique is claimed to be still superior to any other, and is applied either to powdered or crushed wax.

The name of Price's as a candle producer goes back to the early 19th century. E. Price and Co. was founded in 1830, and works to develop a patented process were set up on the Thames at Vauxhall, becoming Price's Patent Candle Co. in 1847. The London factory was concentrated in Battersea in 1863—only four years after the Drake well had been drilled.

Longest UK Crude Pipeline

Work has started on the 18-in. crude-oil line to link British Petroleum Co.'s new deep-water tanker terminal under construction at Angle Bay, Milford Haven, with its Llandarcy refinery—a distance of 60 miles. Work is being concentrated initially on the refinery end, where there are difficult road, river, and railway crossings. Pipe is being buried throughout at least 2½ ft, and the main run of line will be started next spring, with completion set for end of 1959.

Rise In Oil Fuel Consumption

UK deliveries into consumption (excluding bunkers) totaled 22.4 million tons in the first nine months of 1958, according to details collected on behalf of the UK Petroleum Industry Advisory Committee and published by the Petroleum Information Bureau. This compares with 17.7 million and 18.7 million in the same periods of 1957 (when deliveries were severely affected by the Suez crisis) and 1956, respectively. Summarized details are given in Table I.

In view of the 1957 restrictions, comparison between the 1958 and 1957 periods is unrealistic, and it is better to consider the average rise over the three-year 1956-58 period as having been almost 10%. Similarly, changes in the main classes are best illustrated by considering the 1956 period as equal to 100. On this basis, against an index of 104 for motor spirit in the 1958 period, and 115 for diesel-engine road fuel, the very high index of 140 is shown for gas, diesel, and fuel oils (or 148 if refinery-fuel consumption is excluded). This is a truer measure of the great surge to a "heavy oil" economy.

TABLE I
UK DELIVERIES INTO CONSUMPTION
(1,000 Long Tons)

	January to September		
	1956	*1957*	*1958*
Aviation fuels	1,345	1,240	1,226
Motor spirit	4,845	4,253	5,020
Industrial and white spirits	224	242	250
Kerosine	991	897	1,093
Diesel-engine road fuel	1,322	1,309	1,516
Gas, diesel, and fuel oils	8,010	7,799	11,231
(Inc. refinery consumption)	(1,641)	(1,567)	(1,813)
Lubricating oil	649	613	651
Bitumen	715	653	656
Other products	605	666	769
Total	18,705	17,671	22,412

More Finance For BP Tankers

British Petroleum's tanker-building program is being financed by a further £12 million, to be supplied by institutions in the city of London. This follows a similar operation early 1957, when £40 million was raised. Clyde Charter Co. Ltd. has been formed for this purpose with a nominal capital and owned equally by Robert Fleming and Co., Ship Mortgage Finance Co., and British Petroleum. Ship Mortgage was concerned with the previous £40 million operation. Clyde Charter will raise £12 million of loans on the security of six tankers building in the UK and due for completion in 1959. These vessels will be chartered to BP Tanker Co. on terms calculated to cover loan interest and retirement over 24 years, after which the vessels will revert to BP Tanker Co.

New Publications

"Oil Pollution at Sea"—With the coming into force of the International Convention for the Prevention of Pollution of the Sea by Oil, the Ministry of Transport issues a revision of the manual on this subject first published in 1957. Describes how spillages and leakages can be avoided, and includes maps of the prohibited areas, especially around the UK. Copies from H. M. Stationery Office, London, price 1s. 3d. by post.

"Oil in the Middle East"—Brings up to date the Petroleum Information Bureau's memorandum in its world oil area and country series. Covers authoritatively in broad terms the current production situation in each country as well as the general area position in regard to pipelines, refineries, and oil agreements. A clear map is included. Copies free from P I B, New 29 Bond Street, London, W.1.

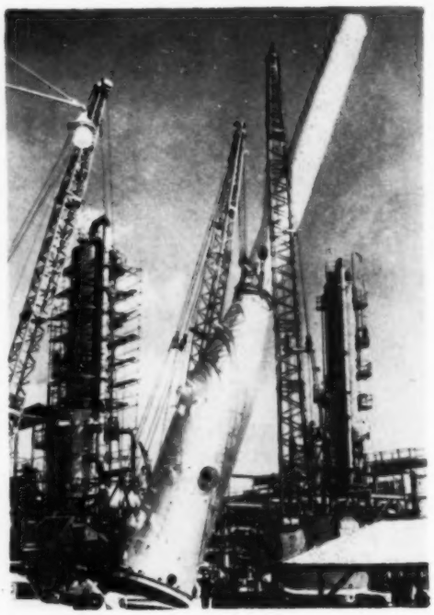
"BP Kent Refinery"—A beautifully illustrated account in color and a well documented record of the current scope of British Petroleum Co.'s £85 million refinery on the Isle of Grain, now one of the largest and most modern in Europe. Throughput capacity has been raised by stages, and is now 7,200,000 tons a year. Copies from Information Department, British Petroleum Co. Ltd., Finsbury Circus, London, E.C. 2.

"Tanker Safety Code"—This is Part 5 of the Institute of Petroleum's Code of Safety Practice in the Oil Industry, the first four parts having covered the Electrical, Marketing, Refining, and Drilling and Production aspects. (An Aircraft Refueling Safety Code is in preparation, to form part of the marketing code). It gives a guide to safe operational procedures in ships carrying oil cargoes. Although mainly applicable to larger bulk cargoes, the principles laid down may also be applied to small self-propelled and nonpropelled craft in marketing distribution and in certain production activities. Copies from the IP, 61 New Cavendish Street, London, W.1.; price 12s. 6d., post free.

"Competitive Aspects of Oil Operations"—The Institute of Petroleum issues in a 203-page volume the seven papers discussed at its 1958 summer meeting under this theme heading. Chapters cover: (1) "Competition in the Modern Economy" (P. W. S. Andrews, Fellow, Nuffield College, Oxford); (2) "Oil-Industry Structure" (O. F. Thompson and A. F. Peters, Shell Petroleum Co.); (3) "Competition in the Search for Oil" (J. McV. Luard, British Petroleum Co.); (4) "Competition in Research and Development" (C. S. Windebank, Esso Research Ltd.); (5) "Competition in Quality" (S. F. Chisholm and G. A. Dickins, Mobil Oil Co.); (6) "Competition in Marketing" (A. L. King, Shell-Mex and BP Ltd.); and (7) "Crude-Oil Prices—the Next Five Years" (David Ovens, *The Economist*). Copies from the Institute of Petroleum, 61 New Cavendish Street, London, W.1. price 30 s., post free.

"Handbook of the Petroleum Industry"—This book, under the general editorship of George Sell (Institute of Petroleum), worthily upholds the standard of the *Newnes Industrial Handbook* series. Though stated to be designed to provide a background of information for "young people" considering a career in petroleum and for those already in the industry, and not as a textbook on petroleum, it goes well beyond this. Twelve specialists provide a wealth of lucid information, with a minimum of technicalities, on the chief avenues of oil-industry activity. Many in the industry who are not "young people" will find useful for reference purposes the details in the last chapter of exploration companies (under country headings) and the charts depicting the worldwide ramifications o British Petroleum Co. and the "Shell" group. Published by George Newnes Ltd., London; price 25s net.

F. J. Morrison



Big lift at Kwinana: Three cranes, together capable of lifting 45 tons, were used to lift the 48-ton 119-ft-long bloudown stack into position at BP's Kwinana oil refinery in Western Australia. The stack is the highest installation in the refinery's new £4.3 million catalytic reforming plant. It took no more than 20 minutes to get the towering steel shell into place. It was maneuvered into position on its deep concrete foundations and bolted down.

Personals

F. J. MORRISON has succeeded E. J. Shearer as managing director and chief executive officer of Overseas Tankship (UK) Ltd. At the same time, Mr. Morrison, who for the past six years has been joint general manager of Caltex Trading & Transport Co. Ltd., succeeded Mr. Shearer as joint managing director of the company.

ALVIN P. MARTIN, LL.B., has succeeded Laszo Gombos, LL.D., as Gulf companies' Eastern Hemisphere counsel and head of their London law department. Mr. Gombos is relinquishing the post and returning to private practice. Mr. Martin was admitted to the bar of Texas in 1940, and spent three years in the US Department of Justice. After war service on the staff of the Commander, U.S. Naval Forces in Europe, he joined the law department of Gulf in Texas in 1946, and for a number of years had extensive experience in antitrust matters and a wide variety of litigation in many parts of the world, having been appointed to the law department in London when it was established in 1955.

L. M. T. CASTLE, director and secretary of Stewarts and Lloyds Ltd., has resigned as secretary and been appointed managing director for finance and general administration. J. R. Menzies-Wilson and Sir Frederick Scopes have retired as managing directors, but both remain on the board.

Typical of the sort of super service station BP is building across the two provinces, this BP garage stands at the corner of Ontario and Leclaire Streets in down-town Montreal. Says 42-year-old owner WILLY SWEET (cleaning windscreen) "It's a darn nice outfit, BP. Sales? I was up 4,000 gallons first month I took over."

CANDID CANADA SPEAKS ITS MIND

It was only in April 1957 that the first gallon of BP gasoline was sold in Canada.

Today, BP Canada Limited (an affiliate of the international British Petroleum Company Limited) operates a chain of over 350 garages, spanning across the provinces of Ontario and Quebec. Later this next year, BP will have around 700 garages. And by 1960, a great new BP Refinery will be in operation at Ville d'Anjou. Recently a special reporter was sent over from London to find out just what Canadians think of BP's great new development. What the motorists think, you can read on this page. They think BP's good. But what of the men who sell it? For this, come to the BP Don Mills service station, Toronto City. Here works expatriate Britisher Mr. W. R. Matthews. He used to sell BP in England. Now he sells it in Canada. And what does he think? "Sir," he said to the BP reporter, "the future of BP in Canada? The answer is WOW!"

Driver of a British Ford Anglia, 74-year-old SAM DIAMOND of Ottawa. "I find BP 100%. Been using it for about a month now and yes sir, I find everything about BP just fine."

Out for a weekend trip with his wife and 7-year-old daughter Marilyn, DONALD MORRISON of 28 Greenland Road, Don Mills. "I always use BP, it sure is OK by me."

28-year-old VIC ORTIZ of 4 Hollywell Drive, Toronto City, drives Ford Fairlane 235-774, is himself in the automobile business: "It's real fine gas is BP. As for service, I reckon they give the best you'll find in the city."

Pipe Line Spread Boss, 37-year-old WILLIAM BERNARD of 74 Jackman Avenue, Toronto. "I always use BP and I find it works real good. I reckon British goods are just fine."

THE BRITISH PETROLEUM COMPANY LIMITED

BP

CANADIAN NOTES

CPA Protests Borden

The Canadian government has been urged by the Canadian Petroleum Assn. to beware of imposing "excessive regulation" upon the nation's energy resources industries along the lines implied in the Borden Royal Commission interim report, because it would deal a serious blow to the present attractiveness of Canada as a sound nation in which to invest. At the same time, the government was presented with the association's formula for a clear division between policy making, advisory and regulatory functions, of energy authority in Canada.

In conclusion, the Canadian Petroleum Assn. wishes to reiterate:

1. That many recommendations of the Borden commission as stated in its interim report would, if implemented, result in excessive regulation damaging to the best interests of Canada.
2. That there should be a division of energy authority as between policy making, advisory and regulatory functions.
3. That the government should not relegate policy making to any board.
4. That an energy board can best serve the national interest if limited to fact-finding and advisory responsibilities.
5. That regulatory powers should continue to be administered by the Board of Transport Commissioners, supplemented by the addition of an Oil and Gas Division.
6. That it is vital to the national interest that greater utilization of western Canada's surplus gas reserves should not be delayed, and that the existing Board of Transport Commissioners be used to expedite action at the federal level in current gas-export application.
7. That elimination of "leverage" on pipeline shares would hinder the financing of new pipelines in Canada; would reduce opportunity for publication investment in pipelines; and would inevitably increase the cost of oil and gas to consumers.
8. That all private business is based on sanctity of contract, and no changes in government policy should be made which would fail to uphold that principle.

To Build Alkylation Unit

A 650-bbl alkylation unit is to be built by Imperial Oil Ltd. at its Winnipeg refinery. Engineering for the $2.6 million project has been under way for some time, and construction will begin in the spring. Canadian Bechtel Ltd. will erect the plant.

Draft Export Legislation

A statement by a member of the Canadian cabinet indicates that legislation was being drafted for submission to parliament in January to establish new procedures recommended by the Borden report for gas-export licenses, but it is not expected to be in operation for at least 10 months.

11-Month Completions

November well completions slumped badly after an excellent October, to 185 wells—down 41 wells or 18%, from November 1957. Development wells held up at 148, compared to 163 in 1957; but wildcats were off badly at 37 compared to 63. Cumulative 11-month totals were 1,826 against 2,067 development completions, 510 against 547 wildcats, and 2,336 combined against 2,744 wells.

Canadian Follow-Up

The largest follow-up drilling program on record is being started by Shell Oil Co. of Canada Ltd. around its discovery at Shell Simonette 12-9-25, in the Simonette River area, west of the Kaybob oil field and near the fabulous Berland River gas discovery. Shell is drilling four stepouts at distances of $1\frac{1}{4}$ to $2\frac{3}{4}$ miles from the combined oil and gas discovery. All will be 12,000-ft tests.

Edmonton Products Line

Pembina Pipe Line Ltd. has announced revival of plans for a products pipeline from the Edmonton area to the lakehead in northwestern Ontario, to carry byproducts from natural-gas processing. Project is long-range, depending on export and other gas markets, as well as sulfur markets.

Canada's Sulfur Potential

Forward estimates indicate Canadian producibility of elemental sulfur by 1963 could be 2,800,000 tons per year, if all plans for domestic and export transmission of natural gas materialize. Severe disposal problem will be created if this producing rate is attained, but tremendous demand for processing plants will occur if market can be found.

Canadian Export License

In spite of recommendations in Borden report, two gas pipeline companies will proceed through normal current channels to apply for export permits. Alberta and Southern Gas Co. Ltd. and Westcoast Transmission Co. Ltd. announced they will apply to Board of Transport Commissioners for dominion export permit, while USA affiliates present application to Federal Power Commission.

Trans-Canada Deliveries

Trans-Canada Pipe Lines Ltd. has all six compressor stations in full operation; will add five more in 1959, with ultimately 27 to be built before major looping begins. Company expects peak day load this winter to be 263,400,000 cu ft per day; average nearly 200,000,000.

Canadian Geophysical Crews

Geophysical exploration activity to end of November was 1,002 crew-months, with prospect of 1958 total around 1,100, compared to 1,397 in 1957. Rate of decline was halted, however, with October and November activity only 5% under same months of 1957. Northern fall and winter work was slow starting.

Propose 100,000 B/D Export Line

A $150 million pipeline, routed 1,200 miles from Alberta to the Great Lakes area, has been proposed by Pembina Pipe Line Ltd., Calgary, as the second of two proposed lines to carry byproducts from Alberta natural gas to market. Under current planning, this newly announced line (diameter not yet determined) would be built to handle between 100,000 b/d and 150,000 b/d of byproducts. Previously, announcement had been made that Foothills Products Pipe Line Ltd., a Calgary-based firm sponsored by interests of Pembina Pipe Line and Mannix Ltd., advanced plans for construction of an $80 million products line from Alberta to the Pacific Coast.

Foothills Products Pipe Line has carried out engineering and marketing studies for Pembina Pipe Line in connection with newly announced plans for the Great Lakes line.

New Swan Hills Discovery

Pan American Petroleum Corp. and British American Oil's Swan Hills 14-33 new discovery, about 115 miles northwest of Edmonton, on drillstem test in the upper 48 ft of the Slave Point section flowed 56 bbl of oil per hour on $\frac{1}{2}$-in. surface choke. It is four miles northwest of recently completed Pan Am-BA Morse River 4-13 discovery.

Celebrates 50th Birthday

Canadian Oil Companies Ltd., the only major fully-integrated oil company owned and operated by Canadians, celebrated its 50th anniversary in December. The company was founded in Toronto in 1908 and, until control was bought by Canadian interests in 1938, the company was operated as the Canadian subsidiary of the National Refining Co., of Cleveland, Ohio.

The growth of the company, particularly in the last 10 years, has lifted it into the front rank of the Canadian oil industry. From 1948 to 1957 assets rose from $20 million to $110 million, and net profits from $887,000 to $4,010,000.

The company's 30,000-bbl refinery at Sarnia, Ont., is now being stepped up to 50,0000 b/d. The company also has substantial interests in oil fields in western Canada, interests in pipelines, and a network of bulk plants to serve 3,000 dealers.

Personals

DONALD L. REDMAN, formerly manager of operations, has been elected vice president-operations, of Central-Del Rio Oils Ltd., and re-elected a director. He joined Central Leduc Oils Ltd. as chief engineer in 1952, and in the fall of 1955 was promoted to manager of operations and made a director.

DR. E. W. WEST has been appointed chief geologist for Triad Oil Co. Ltd., Calgary. Previously he had served as assistant chief geologist and as acting chief geologist.

JAMES M. CORRY has been appointed exploration manager for Franco-Delhi SA, wholly-owned subsidiary of Canadian Delhi Oil Ltd., Calgary. His headquarters will be in Algiers. He had been serving with the company as staff geologist and geophysicist. Canadian Delhi announced further that G. L. Dakin has been appointed chief accountant.

H. H. Clare

A. G. Moreton

HARVEY H. CLARE has been appointed assistant manager of the Montreal East refinery of Imperial Oil Ltd. He succeeds John J. Rowan, who now is manager. Mr. Clare joined Imperial at Calgary in 1942, and has been technical superintendent at Montreal and chief operations manager in the engineering division at Sarnia. He has been succeeded in this latter position by **A. G. MORETON**, formerly coordinator of production planning and control in the manufacturing department at Toronto.

JOHN S. POYEN has been appointed assistant manager of the Edmonton producing division of Imperial Oil Ltd. He formerly was regional manager of contracts and unitization at Calgary, where he has been succeeded by John H. Hamlin.

CHARLES A. STOLLERY, vice president of Poole Construction Co., Calgary, and **GORDON GRANT** of Regina, president of the insurance agency of Walter M. Logan and Co., have joined the board of Royalite Oil Co. Ltd. Calgary.

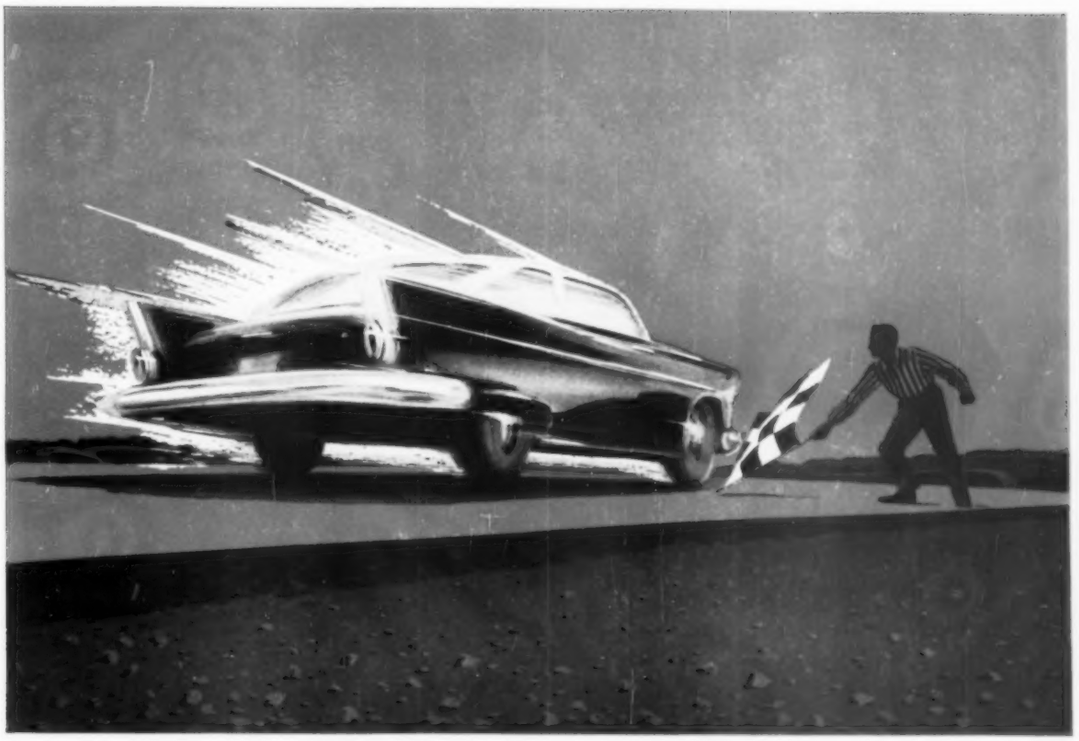
F. T. GLASSCOCK of Pennant Drilling Co. Ltd., Calgary has been named president of the Canadian Assn. of Oilwell Drilling Contractors. This post formerly was held by D. K. Gunderson of Regent Drilling Co. Ltd. S. W. Shambaugh, of Reading and Bates Drilling Co., becomes vice president, the post formerly held by Mr. Glasscock.

JAMES W. KERR, of Hamilton, Ontario, has been appointed president and chief executive officer of Trans-Canada Pipe Lines Ltd. He succeeds Charles S. Coates, president since 1957, and elected Trans-Canada's chairman to fill the vacancy created by the resignation of N. E. Tanner, Calgary. Mr. Tanner will remain as a director.

A native of Hamilton and an engineering graduate of the University of Toronto, Mr. Kerr, 44, takes over the Trans-Canada post from the position of vice president and general manager of the Canadian Westinghouse Co.'s apparatus products group.

J. W. Kerr

C. S. Coates



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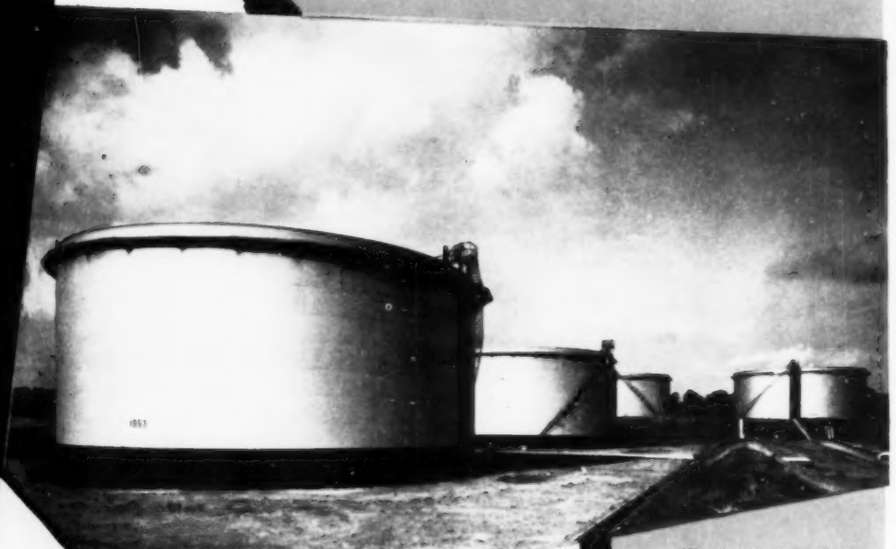

Floating Roof Tanks for the storage of gasoline at Stanlow Refinery, Cheshire. (By courtesy of Shell Refining Co. Ltd.)

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Mission SUPER-SERVICE® Mud Pump Valves *for medium pump pressures.* Four crossarms provide extra strength and large striking surface, assuring long valve seat life without restricting flow area.

Mission SILVER TOP® Mud Pump Valves *for low and medium pump pressures.* Replaceable, wear-taking bushing greatly reduces valve seat replacement costs. The famous Compound 308® inserts are interchangeable with Mission Super-Service Valves.

Mission Mud Pump Valves are available for all popular makes of mud pumps. Buy them anywhere through your supply store.

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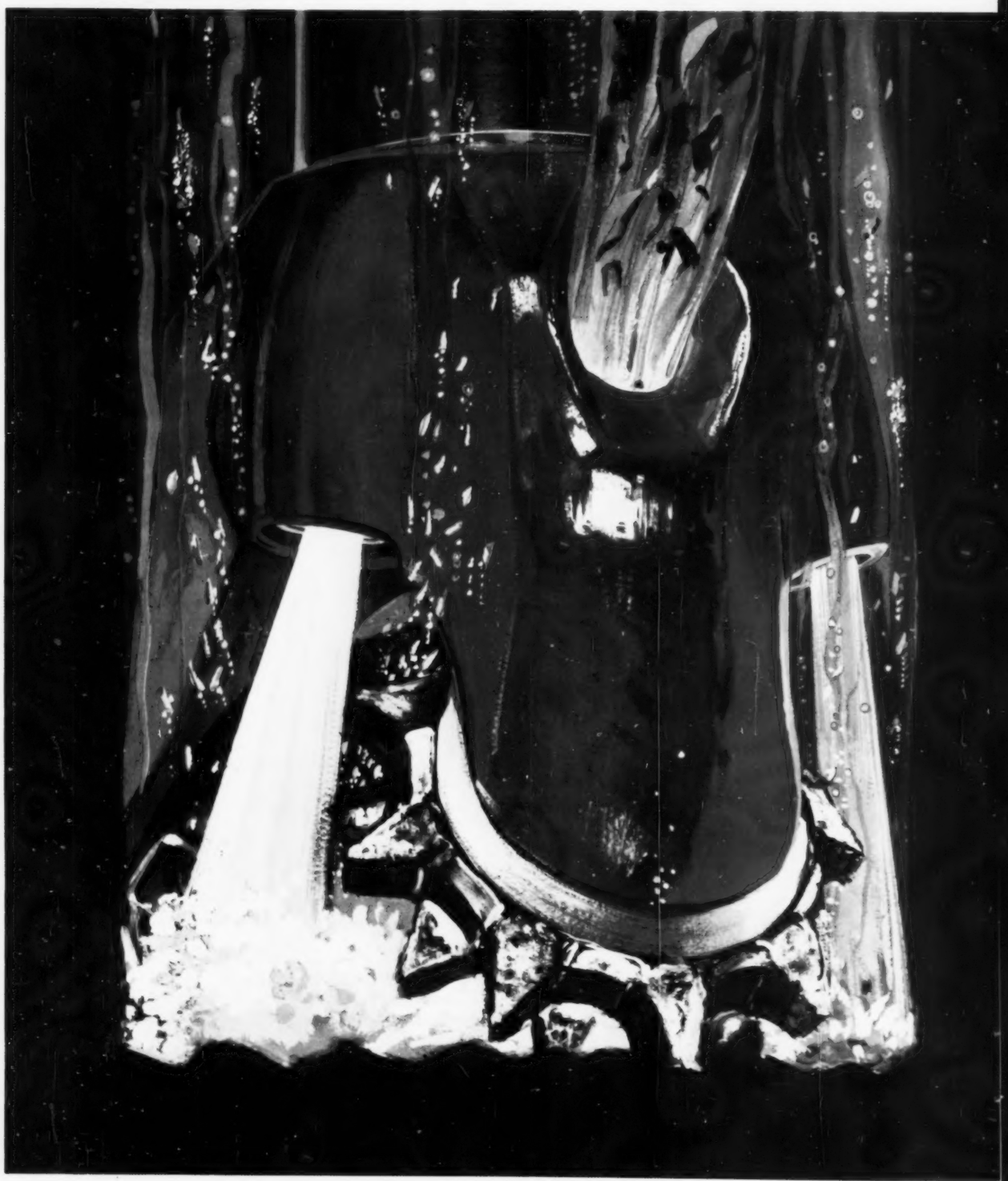

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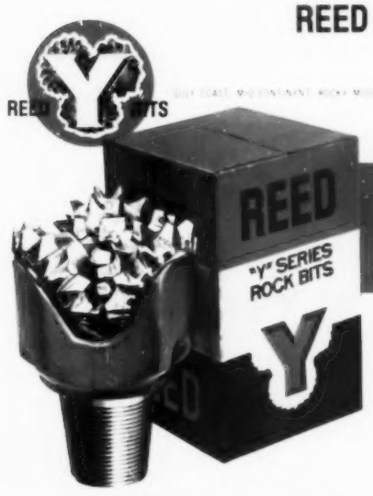

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Throughout Asia, Africa and the lands of the Pacific, new industries call for more oil. And Standard-Vacuum is doing its best to meet the demand. Stanvac finds the oil, transports and refines it, then delivers the finished products—all within the area where Stanvac operates.

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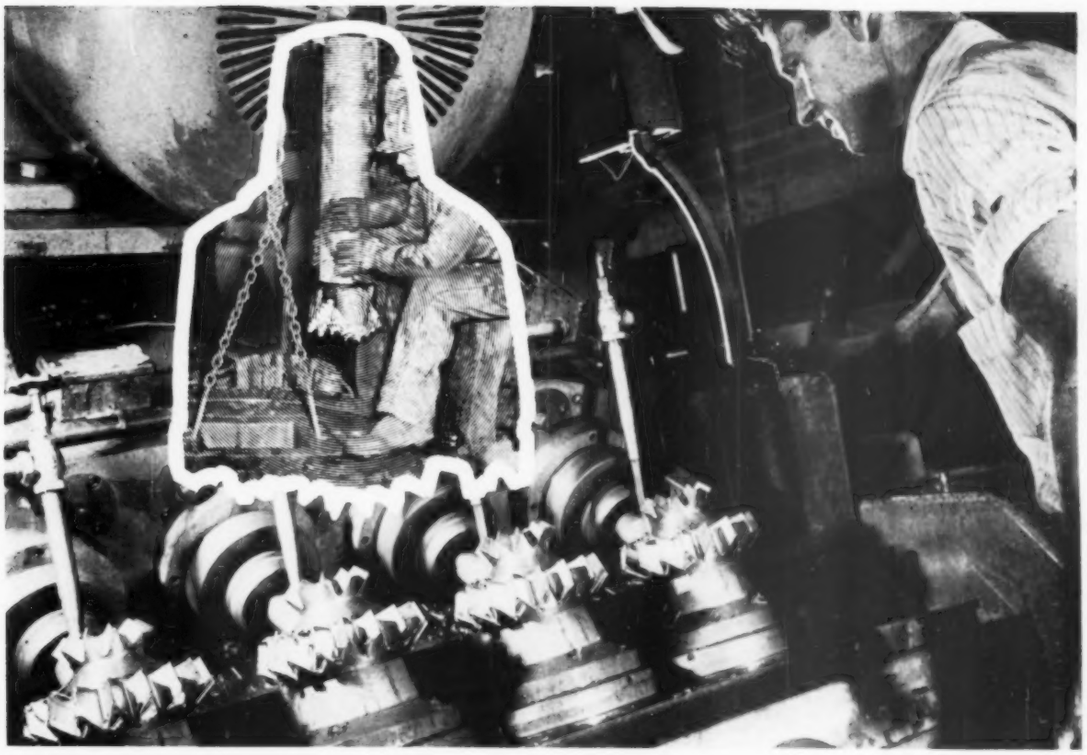

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LATIN AMERICAN OIL NEWS

Brazil's Oil News

Crule production, official, January 1 to November 17, 1958, was 16,200,116 bbl (50,467.7 b/d); November (calculated) 1,805,730 bbl (60,191 b/d). A new record was established, November 14, when production reached 62,332 bbl.

Rigs operating in November totaled 52.

Engineer Genisio Barroso, production superintendent for the Bahia Reconcavo, estimates the value of the recoverable Reconcavo reserves at US $1.4 billion, or eight times the value of Brazil's investment to date in prospecting for and exploiting petroleum. The municipalities in which the reserves are situated receive 1% of the oil produced within their borders, in accordance with the law. Thus, Sao Francisco do Conde's municipal revenue increased fivefold between 1954 and 1957, while its receipts from the sales' tax rose 57% between 1956 and 1957.

The state of Bahia, in turn, receives from Petrobras 4% of the oil produced within its territory. This percentage yielded 43 million cruzeiros in 1957 and 40 million during the first half of 1958.

The following table shows the principal producing fields in September 1958, with the number of wells operating and the average production per field:

Principal Field	*No. of Producers*	*No. of Wells in Production*	*Average Production Per Field (Barrels Per Day)*
Agua Grande	57	53	36,000
Candeias	99	60	16,000
Dom Joao	176	53	2,700
Mata	26	17	1,600

A fire broke out in the Presidente Bernardes refinery, caused by the rupture of the suction line of one of the pumps, killing three operators and damaging one of the processing towers. The fire was put out within two hours, but production of refined products, particularly of GLP, was substantially reduced during the next few weeks; so, also, was the output of the ethylene unit and the fertilizer factory.

As a result of the decision of the Controller of Currency and Credit, increasing the cost of the US dollar for imports of petroleum to 80 cruzeiros from 58.82, the price of gasoline has been raised 26.3%, kerosine 28.8%, diesel oil, 28.4%, fuel oil 30% in the Federal District and proportionately in other districts. The *sole tax* on liquid fuels has also been increased. Example: aviation gasoline, imported, per ton, pays now 4,224.20 crs.; national ditto, 2,272.50 crs.

Petrobras has signed a contract with Societa Finanziaria Meccanica for the purchase in Italy of equipment for the petroleum industry valued at US $15 million. The material is to be paid for within five years of the date of shipment.

President Kubitscheck has appointed a committee to examine the accusations by the president of the Petroleum Council against Colonel Janari Nunes' administration of Petrobras. Independent of their investigations, a parliamentary committee of investigation was to hear both parties to the dispute.

The Petroleum Council has authorized Petrobras to import 1,800,000 bbl of Kuwait crude which the Capuava refinery will process for Petrobras. The Capuava refinery has received the exchange necessary to pay for 3,600,000 bbl of crude, its established quota for imports during the second half of 1958.

The Russian government has refused to ship the petroleum, ordered by Brazil, simultaneously with the dispatch by Brazil of the corresponding quantity of cocoa beans. Its action seems likely to affect the negotiations for a trade agreement between the two countries.

Brazilian Developments

Petrobras, which has spent more than $2 million in drilling 13 wells in the Alagoas area of Brazil, reportedly plans three or four more wells before calling it quits. Only one of the 13 is a producer, producing 40 b/d of high-viscosity crude with a paraffin base.

Future plans are for two moderately deep wells along the lower Sao Francisco River and one or two near Pilar. Plans are to shift the four drilling rigs of the Haney-Williams Co. of California, operating under contract, to Sergipe. Haney-Williams is one of two USA firms drilling under contract. The other is Drilling and Exploration Co. Inc., of Nevada, which has two deep-well rigs.

The USA firms estimate costs in Alagoas have averaged $25 a foot for 84,500 ft, or a total of $2,122,500. It is rumored a new USA firm called Brantley has contracted to drill several shallow wells up to 5,000 ft, and is importing three rigs.

Equitable Equipment Co., of New Orleans, La., has delivered a 14,060-bbl oil barge to CA Maritima Falcon of Caracas, Venezuela. Christened the "Matilde," the barge measures 200 ft x 50 ft x 10 ft. Accepting the barge for the Venezuelan firm was Felipe Silen, president of CA Maritima Falcon. Mr. Silen also accepted delivery of an "Equity" 65-ft twin-screw diesel tug. Both the tug and barge will be used in transporting oil on the Orinoco River and Golfo de Paria in Venezuela.

British Honduras Deep Test

Phillips Petroleum will drill a 10,000-ft test, first in southern British Honduras, on the Punta Gorda structure about 20 miles from the Livingston well in neighboring Guatemala. Bandini Petroleum holds an interest in the two-million-acre BH tract, as well as in Guatemala's Livingston well.

New Argentine Contract

Argentina's YPF has signed a drilling contract with ASTRA Cia. Argentina de Petroleo SA, a small Argentine producing company with 2,150 b/d production in 1957.

The contract calls for drilling of 30 oil wells for YPF over 24 months. YPF will choose the sites in Manantiales Behr and El Tordillo, both about 40 kilometers from the town of Commodoro Rivadavia. The wells will be turned over to YPF as soon as they are comoleted and placed in operation. Compensation will be based on footage drilled and time employed, and is estimated to come to 60 million pesos. An escalator clause provides for higher pay in proportion to devaluation of the peso, and could raise total pay to 80 million pesos. In a preliminary contract signed last July, the parties estimated eventual total production of about 1,300 b/d from 30 wells.

Mexico Completes Expropriation

Mexico has completed action to forbid any new contracts with private firms for drilling and other oil matters on a percentage of production basis. Only a fee basis is to be used in future contracts, effective November 30, 1958. Present percentage contracts are to be honored, however, but not extended.

Under the legislation, the government asserts control over the petrochemical industry and provides for the 100% nationalization of the oil industry, with indemnification, by virtual cancellation of confirmatory concessions which are oil rights confirmed prior to the Constitution of 1917.

PETROCHEMICALS: Art. 3, Par. 111, states that the petroleum industry "shall encompass the elaboration, storage, transport, distribution, and first-hand sale of petroleum derivatives used as raw materials in basic industries." The next article says that the oil industry is under complete control of the government through Petroleos Mexicanos. This article is interpreted as meaning that Pemex is now in exclusive control of the petrochemical industry.

Many private firms have sought to produce petrochemicals in Mexico. Pemex has stated it has no intention to enter the field, but it has refused to supply parties with needed raw materials. It has long been believed that Pemex is interested in entering the field, but that its funds have been needed for exploration, exploitation, and production and distribution. No large-scale entry into petrochemicals by Pemex is foreseen.

CONTRACTS ON FEE BASIS: Art. 6 provides that Pemex may enter into contracts with private firms anl individuals, but that all such contracts must be on a fee basis and none on a percentage of production basis. Drilling companies holding CIMA-type contracts are the only private ones taking part in production on a percentage basis.

Pemex officials are understood willing to continue contracts now in force, but unwilling to grant new contracts of this type or extensions of old ones.

EXPROPRIATION: Art. 10 authorizes the expropriation, with indemnification, of all oil properties. This article thus provides for the 100% nationalization of the petroleum producing industry by the virtual cancellation of confirmatory concessions, which are petroleum concession rights confirmed prior to the Constitution of 1917.

No information is available as to whether all o. how many of these concessions are to be expropriated, how and when it will be done and the method of compensation. In the past, Pemex has bought the entire production of crude petroleum from the holders of confirmatory concessions. Petroleum produced by these holders in 1957 amounted to 817,000 bbl, less than 1% of Mexico's total crude production.

Model Argentine Contracts

Dr. Horacio Aguirre Legarreta, new president of YPF has announced that, in the future, development contracts would be let only through public tenders. He said model contracts will be established on which interested firms will be invited to make competitive bids. He also warned YPF workers that the strike weapon should be used with prudence, and only in defense of legitimate trade-union interests. He said any action which interferes with oil production is against the higher and permanent interests.

The new charter for YPF provides for 14 directors, seven with no specific areas to represent; five representing respectively the oil provinces of Salta, Neugen, Mendoza, Chubut, and Santa Cruz; and two representing laborers and YPF technical personnel. It also provides for three departments—exploitation, industrialization, and navigation.

The charter provides that YPF will finance its operations with its own resources, and that prices of its products are to be remunerative with the exception of those which the executive declares to be of social benefit. In such exceptions, YPF is to be reimbursed for any deficits. In event of profits, 90% is to be reinvested in YPF activities and the remainder may be distributed among the personnel.

New Guatemala Concessions

Guatemala continues to hand out exploration concessions to oil companies in its northern and northeastern sectors. Latest, in December, was a concession granted to the Utex Exploration Co., of Utah, in the states of Alta Verpaz and Peten. The Ministery of Economy also granted an exploration concession covering 54,125 acres to Oscar Zimeri Naser in the state of Peten.

Exports To Brazil

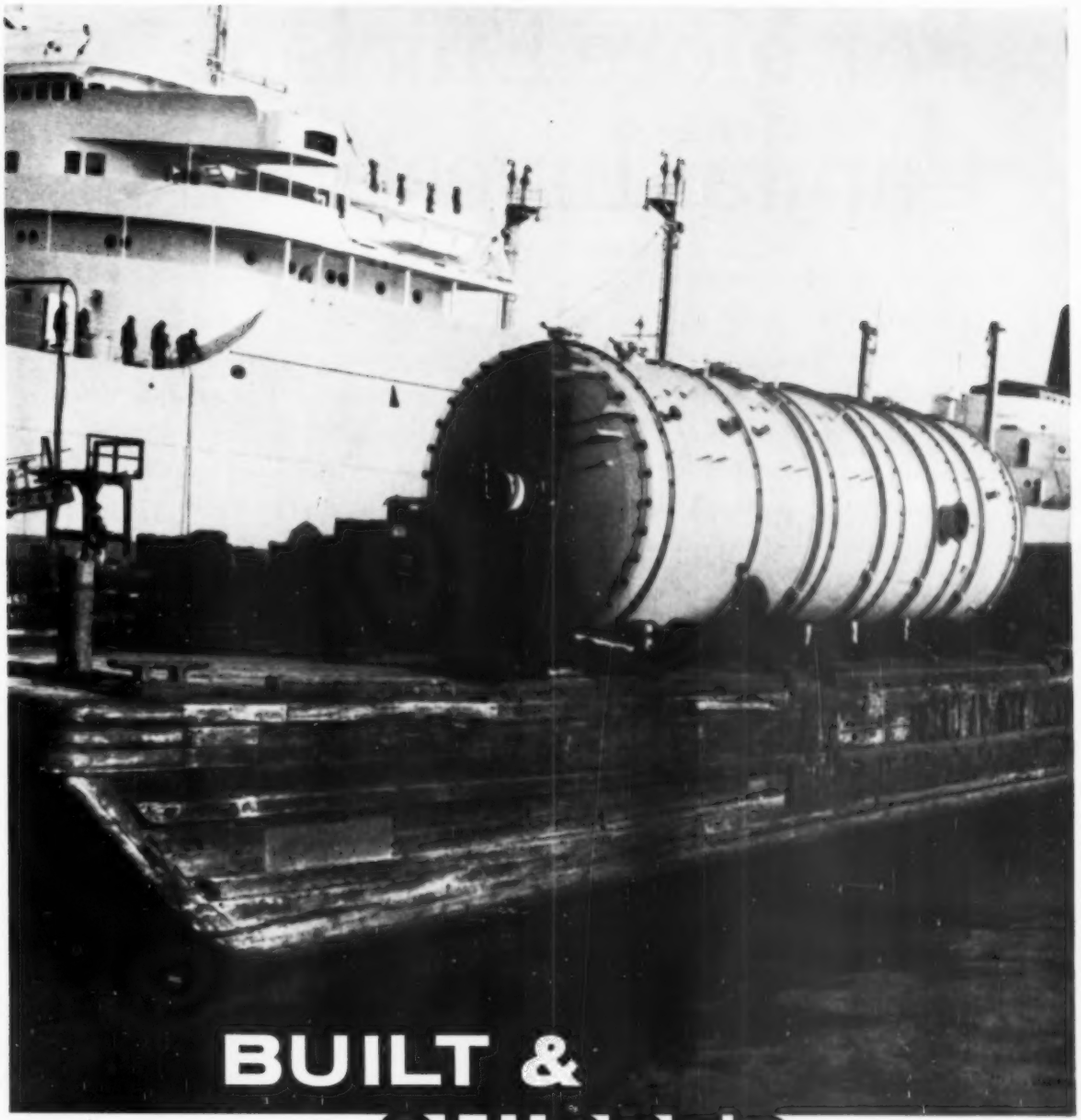
Superior Oil Co., a new producer in Venezuela, has begun exports of petroleum to Brazil. The price of the crude is thought to be considerably lower than US $2.25 per barrel, a discount of 45c to 50c. Shipping charges are considered reasonable, and it is said to be a good deal for Brazil.

Superior will accept payment in Danish currency, which it will use to purchase drilling equipment. By year-end 1958, it was estimated Superior would have exported a million barrels of oil to Brazil.

Erratum

There was a typographical error in the tabulation of world consumption of petroleum in 1957 on page 34 of the January issue. Latin American consumption estimate for 1957 should read 1,443 b/d.

In the world production tabulation for 1958 Venezuela production should have read 2,607,500 b/d; Saudia Arabia 1,013,200 b/d and world 18,098,200 b/d.



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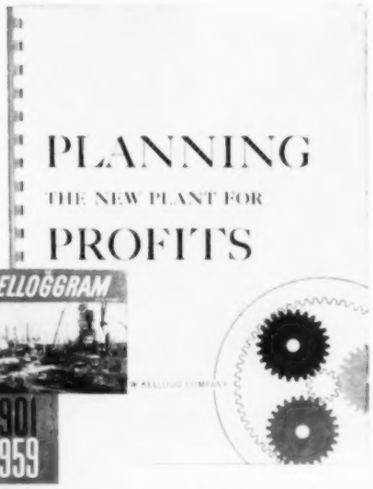
For More Efficient Capital Investments

For oil companies facing up to increasing operating costs and product competition, this year's oil centennial will be a time for seriously studying the estimated capital expenditures and refining economics of the immediate and long-term future, as well as reviewing the accomplishments and methods of the past.

To assist management in making the soundest investment decisions—in terms of plant engineering, procurement and construction, Kellogg has prepared two booklets. One of these reviews this world-wide organization's role in the petroleum and petrochemical industries since 1901.
The other is a comprehensive description of the company's unique economic approach to building the new plant, and fully documents its ability to undertake all or part of the responsibility.

Oil and chemical company executives charged with making capital expenditures will find these booklets profitable reading—particularly the explanation of Kellogg's method of coordinating and controlling the engineering, procurement, and construction of new plants. Copies can be obtained promptly by returning the coupon.



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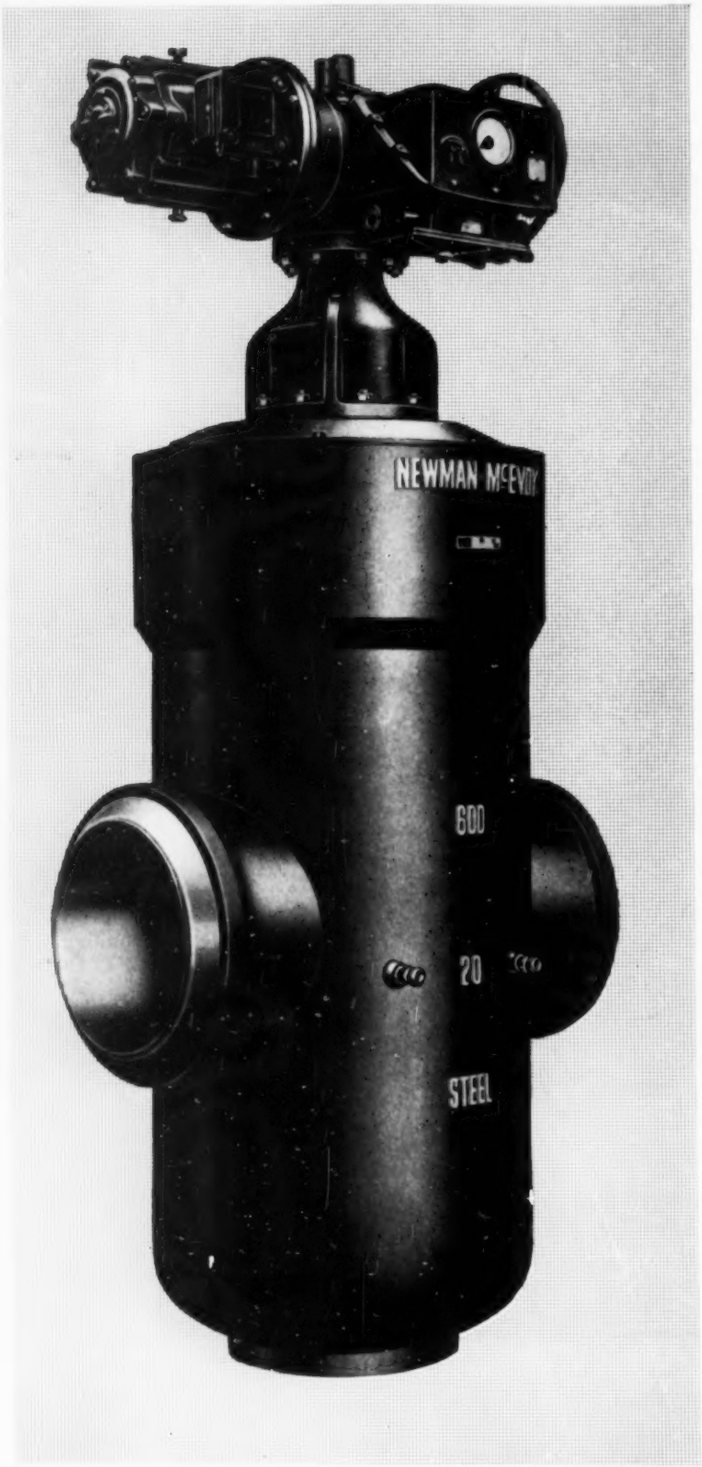

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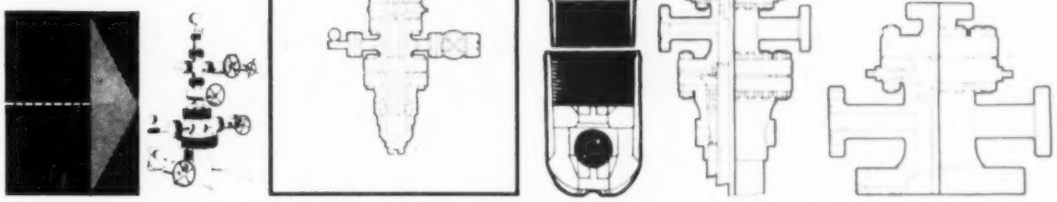

Regardless of where in the world you drill, Rector wellhead and cementing equipment and Rectorseal are available. Through the world-wide export facilities of Continental-Emsco Co., Mid-Continent Supply Co., and Oil Well Supply Division of United States Steel Corp., you can be assured of the *safety* and the dependability of Rectorheads, RectorTrees, Rector Cementing Equipment, and Rectorseal. No other manufacturer of wellhead and cementing equipment can offer as extensive export service as Rector through these three organizations.

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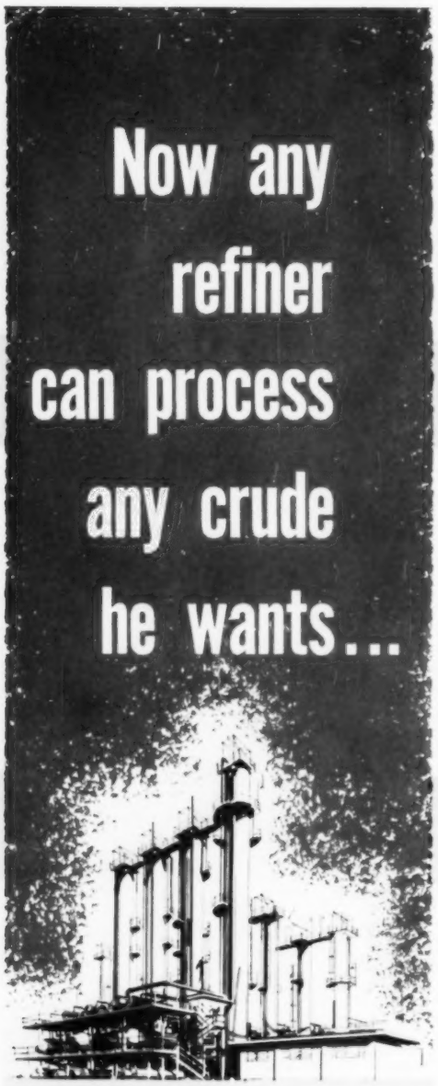

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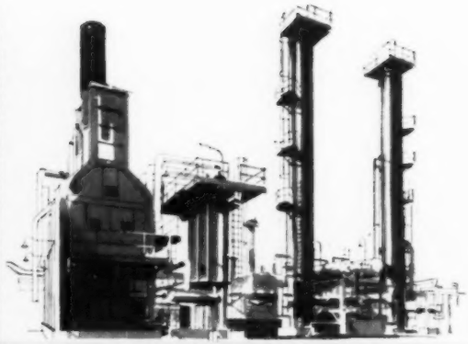

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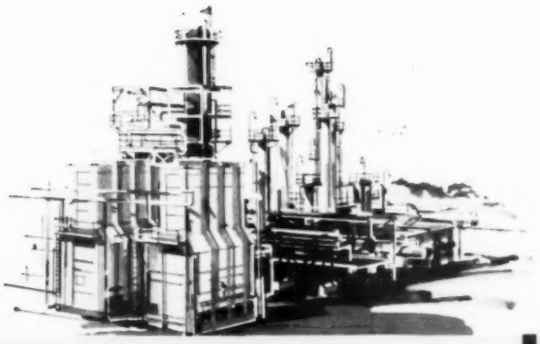

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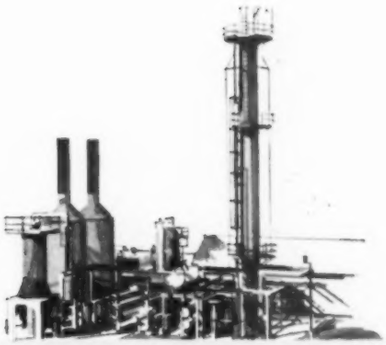

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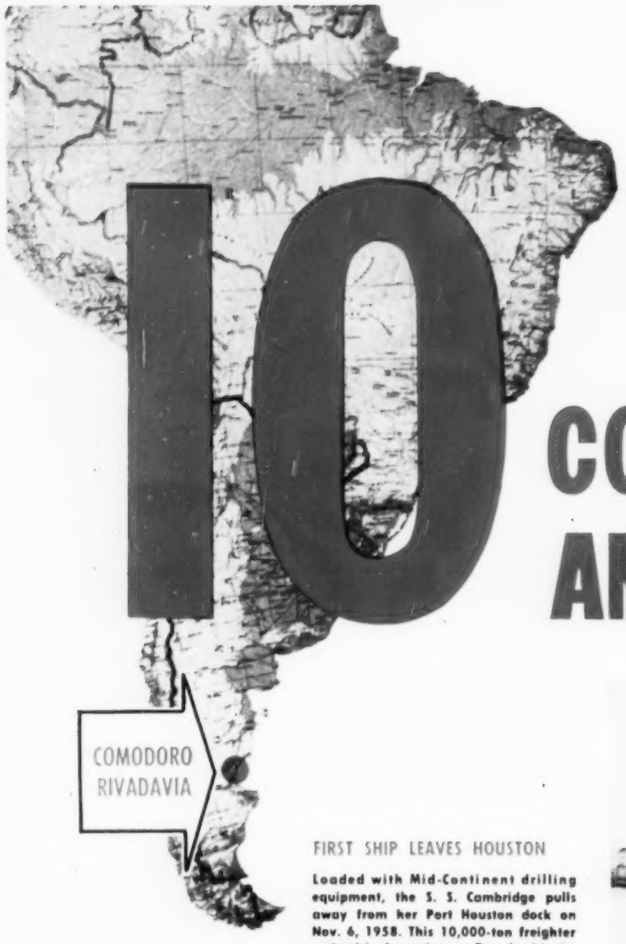

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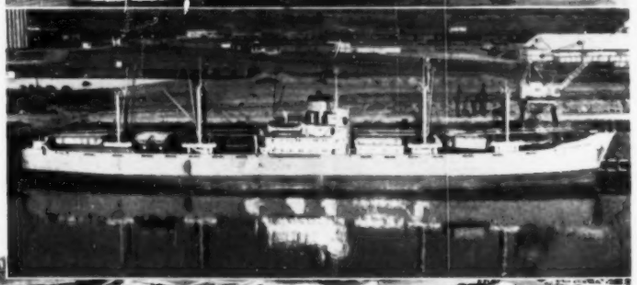
Loaded with Mid-Continent drilling equipment, the S. S. Cambridge pulls away from her Port Houston dock on Nov. 6, 1958. This 10,000-ton freighter arrived in Argentina on Dec. 4 with the first three rigs.

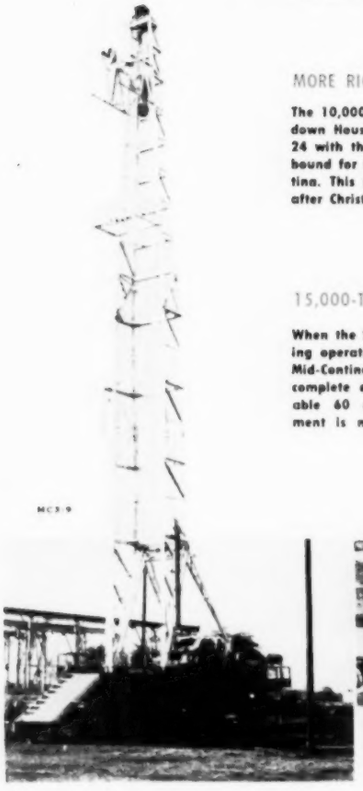
MORE RIGS FOR ARGENTINA

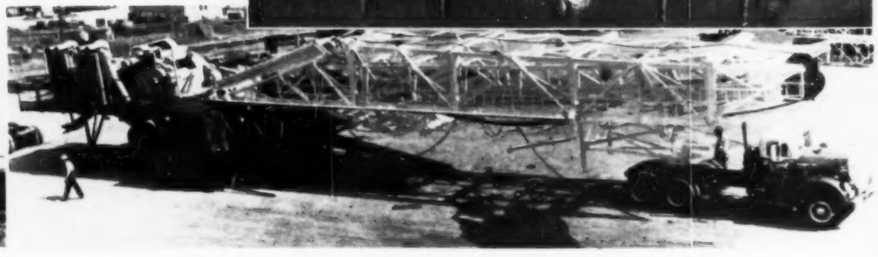
The 10,000-ton S. S. Elderfields steams down Houston's Ship Channel on Nov. 24 with three more Mid-Continent rigs bound for Comodoro Rivadavia, Argentina. This shipment was delivered just after Christmas.



15,000-TON FREIGHTER LOADS UP

When the S. S. Dorian completed loading operations in Houston on Dec. 15, Mid-Continent Supply had shipped ten complete drilling rigs in an unbelievable 60 days! Most of this equipment is now in operation.





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This was one of the biggest movements of equipment ever undertaken in the oil business. It was launched with the shipment of three complete rigs just 30 days after Loffland was assigned the drilling contract. The remaining rigs were shipped in groups of three and four at two-week intervals.

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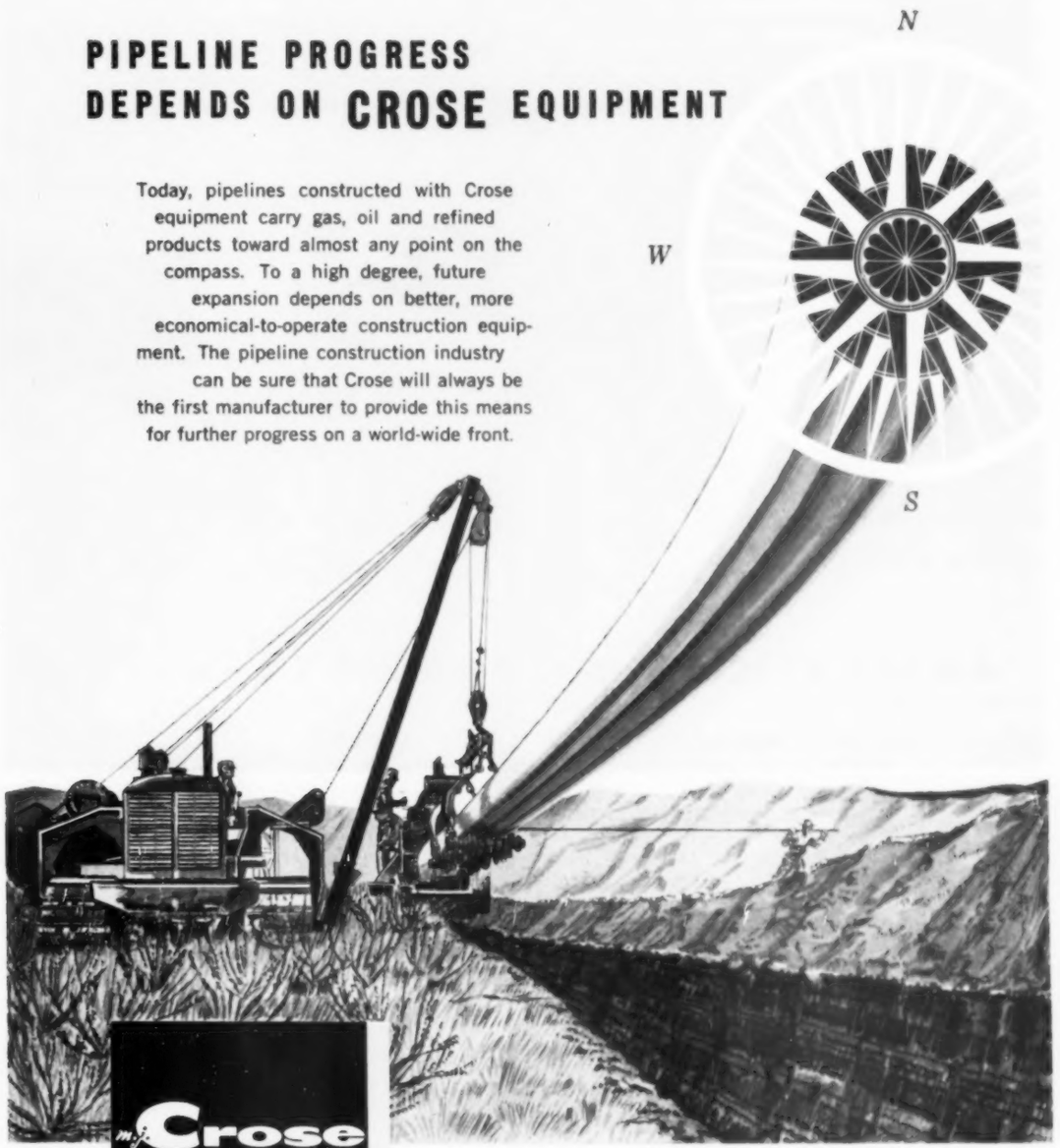

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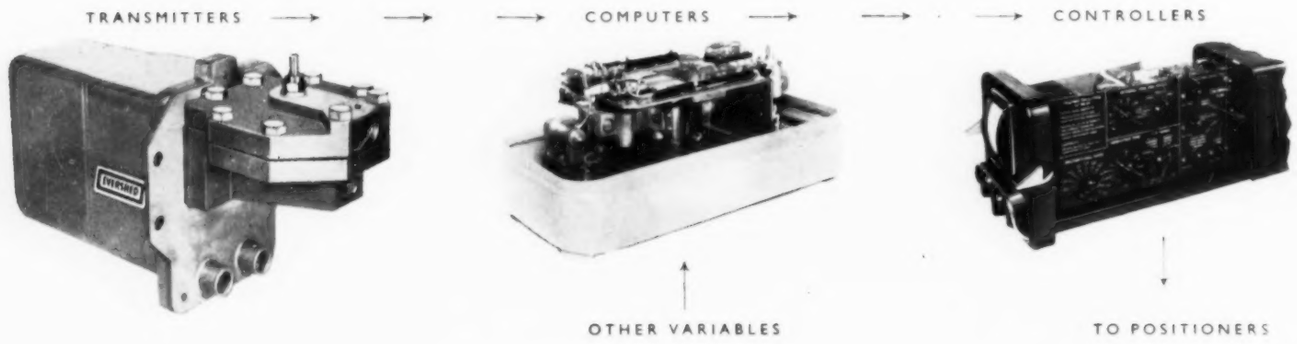

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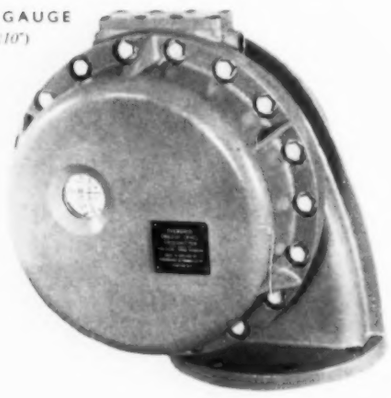

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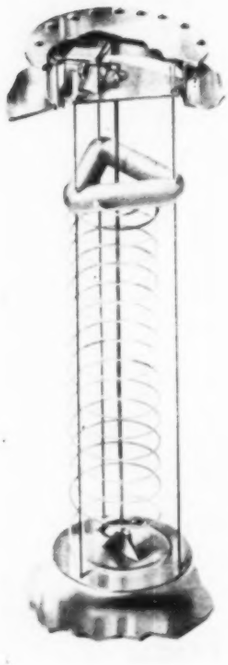

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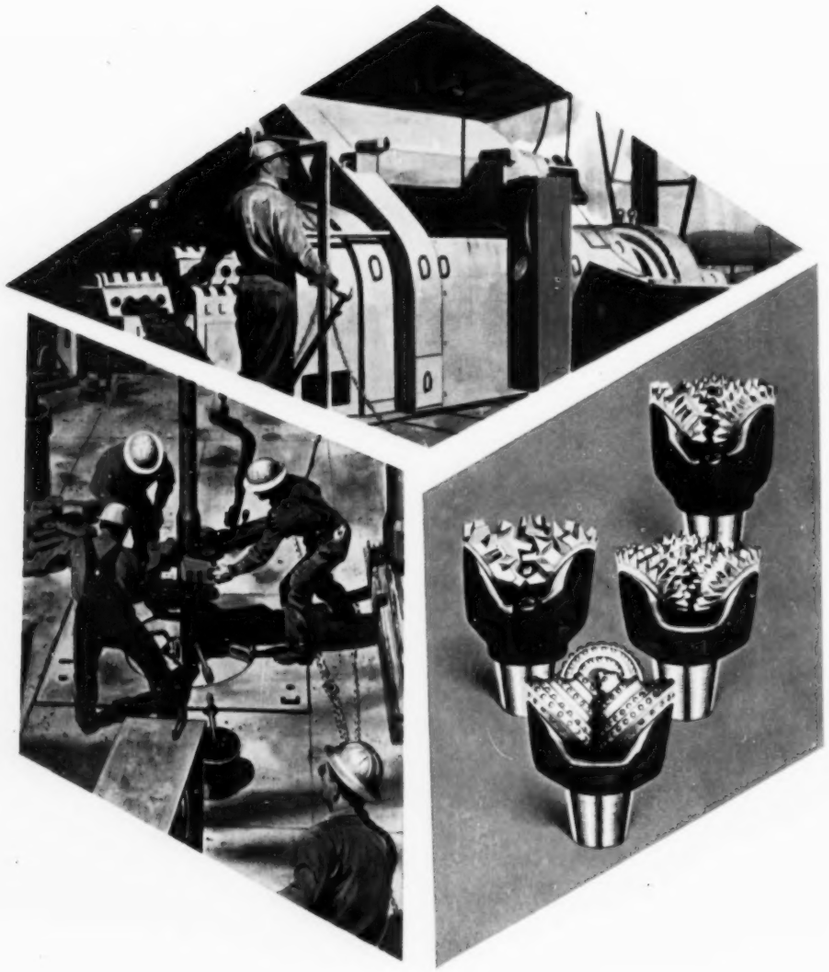

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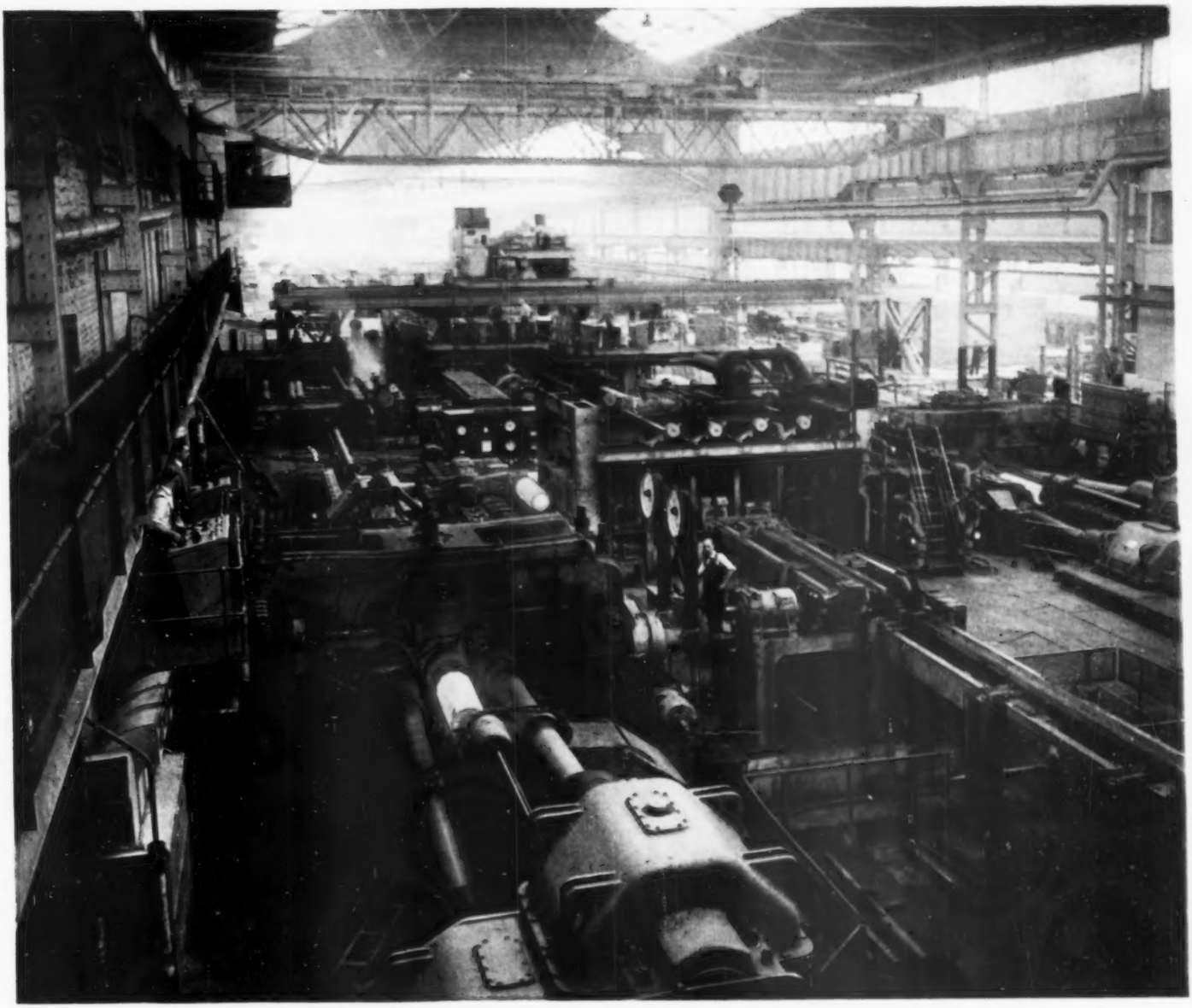

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Venezuela's Dilemma

Now that the verbal battle has subsided, it becomes necessary for the oil industry and the government of Venezuela to evaluate carefully how the junta's retroactive tax decree will affect the marketability of crude from Venezuelan fields as contrasted with oil from other competing sources. Both the oil companies and the people of Venezuela have a big stake in the industry, and it is a matter of mutual interest that crude from the area not be priced out of the market. The most feasible approach to the subject involves dispassionate conferences between the interested parties and the development of impartial economic studies.

It is unfortunate that the action by the junta was taken abruptly. Had it been preceded by a series of meetings between economists representing the industry and the government, it seems likely that some figure could have been agreed upon which would have created some additional revenue for the nation without shrinking its share of the world market. As it now is, the matter has become somewhat emotional—which possibly will make it more difficult to reach a compromise.

Repeal or substantial modification of the tax decree would be highly unpopular with the general public, particularly those who are not familiar with the present status of international petroleum trade. Failure to repeal or to modify the decree substantially will have the effect of drying up foreign investment in Venezuela and of diverting trade to other areas. If business finds this policy to be necessary, the prosperity of the Venezuelan people will decline, reversing the upward curve which has characterized the economy for many years.

There has been general support for the tax increase on the part of political leaders and Venezuela newspapers, part of which doubtless comes as a reaction to statements issued by some oil-industry leaders in their first shocked reaction to the sudden action of the junta. The oil industry's dismay is, of course, natural. In the belief that taxes would remain stable the industry had paid three-quarters of a billion dollars in bonuses for new concessions only a little over a year earlier. Vast sums were being spent to test the new properties which now may yield very little profit. Established companies were faced with a tax action which would cause a serious revision of the anticipated 1958 profit and a quick re-assessment of future policies.

One of the first acts of the government junta following the revolution of January 23, 1958, was to assure the petroleum industry that the business climate would remain favorable. On February 5, Admiral Larrazabal told oil-industry representatives the junta "formally declares its intention of maintaining unchanged the policy under which petroleum activity has been developed and of respecting all legal relationships stemming from existing legislation." The final action of the junta is a direct negation of the policy adopted at the outset of its rule.

It was generally known that Dr. Betancourt hoped to obtain some increase in the nation's income from oil, but that he intended to negotiate the matter with oil leaders and arrive at a decision which would not lose the country's competitive position. In an interview with *World Petroleum*, published last July, Dr. Betancourt said:

"The 50-50 law was established under the government of the Democratic Action party. It is neither a rigid nor an unchangeable formula. We have not changed our well-known policy that Venezuela must obtain all licit advantages possible emanating from the fact that it is the owner of the subsoil from whence comes the crude oil. But we also believe that the decisions on this matter must be subject to full and careful discussion between the parties—seeing always that Venezuelan petroleum maintains its position to compete normally in the consuming markets with that of other countries."

It is an axiom in the field of international trade that foreign capital flees from areas of instability. Administrators of business enterprises responsible to stockholders must be more careful in their policies when they are handling other people's money than if they are investing their own capital. They cannot afford to gamble in areas where there is danger of expropriation, where onerous retroactive taxes are imposed without notice or other restrictions are imposed which may be confiscatory in nature.

A spokesman for Venezuela has been quoted as saying that his government has a perfect right to adopt any legislation it may deem necessary or expedient without consulting with foreigners. This is undoubtedly true. It is just as true that the power to tax is the power to destroy. At some point the law of diminishing returns becomes effective in the field of taxation as in any other phase of human activity.

Venezuela became a great oil-producing nation as a result of the expropriation of oil in Mexico. Had that nation continued to welcome foreign investment in its oil, there can be small doubt that Mexico would be a great oil-producing nation today—exporting vast quantities of petroleum into the markets of the world. Conversely, the industry in Venezuela would be much smaller. Mexican oil has not kept pace with world demand because of inadequate financing and inadequate technical personnel.

If there were a world shortage of oil, the sharp increase in taxes might not seriously affect Venezuela's share of the global market. It would then be possible to increase prices enough to make operations feasible on the same scale. Unfortunately for Venezuela, there

is no shortage and there is not likely to be one in the near future. There are other producing areas capable of producing more oil and eager for the added revenue.

Here in the Western Hemisphere, Canada has been one of Venezuela's best customers. Because of the unhappy fact that Canada's oil is produced so far from its big eastern markets, its fields have been severely prorated while Venezuela and Middle East crude has been imported. Even before the junta's tax increase, western Canadian producers were clamoring for a pipeline to serve the Quebec market. The new tax will make the proposed pipeline more attractive. Once it is laid, the tendency will be to continue its use and forego the 300,000 b/d of Venezuelan oil formerly imported.

The market for Venezuela crude in Canada is in jeopardy even though the Montreal pipeline may never become a reality. Prior to the action of the junta oil companies which had production in both the Middle East and in Venezuela were finding that crude from the Persian Gulf was costing about 25 cents per barrel less than Caribbean oil on the basis of current ocean rates. The effect of the tax increase in Venezuela is to raise the cost of oil from that country by about 17-22 cents per barrel, the exact amount varying in different countries. As an average it appears that Venezuela oil delivered in the Montreal market will be about 45 cents per barrel more costly than Middle East crude. This is a figure equal to or greater than the profit obtained by the average oil refinery.

At the present moment a little under 80% of the crude imported into Eastern Canada comes from the Caribbean and a little over 20% from the Middle East. Most refiners believe that they can handle up to 50% Middle East oil and some were designed to operate entirely on sour crude.

In recent months, Argentina has negotiated contracts with foreign producers under which it will seek to reduce its national dependence on foreign oil. The drive to build indigenous production will be stimulated by any increase in the cost of outside oil.

United States producing fields now are operating at roughly 75% of capacity, a situation brought about by higher costs of finding and lifting oil. The new Venezuela tax will tend to narrow the gap and give domestic wells a somewhat larger share of the market even without government control of imports.

Eastern Hemisphere markets are more severely threatened than those in the Western. A new competitor for the rapidly growing European market is being developed in North Africa. Major fields have been found and transportation facilities are being built which will deliver oil to Europe at a lower transportation cost than that now being borne by oil from the Persian Gulf.

In recent years, Europe has purchased nearly a half million barrels of Venezuela crude and products each day. This represents roughly one-fifth of the nation's current production. Loss of any substantial volume of this outlet obviously would cut deeply into Venezuela government income.

The fuel-oil value of Venezuela crude has influenced some refiners in Europe to import Caribbean oil at a somewhat higher laid down cost than Persian Gulf oil. It now becomes necessary to recalculate cost factors to determine the crude mix which becomes most profitable. New plants now being built in Europe are not equipped with catalytic crackers in order to minimize motor fuel production as compared with middle-of-the-barrel and residual oil yields. Earlier plants with catalytic crackers now must be reappraised to ascertain whether they should be put on a stand-by basis and a shift made in crude source.

While Venezuelan oil has been cheaper than USA oil, it is more expensive to find and lift than Middle East oil. This is because the producing capacity of the average Venezuelan well is much greater than the USA well and much less than the producing capacity of the well in the Middle East. The average well is much deeper and the cost per well for drilling, completion, and operation is greater in both areas than in the USA, but greater producing capacity has heretofore tipped the scales in favor of the foreign oil.

For various reasons, of which hemisphere defense as well as economic climate has been important, the USA oil industry has tended to center its investment in Venezuela. Of the $9 billions invested abroad by USA companies, more than 25% is employed in Venezuela. The annual investment and re-investment is an important addition to the national economy. Creole Petroleum Corp., for example, made capital expenditures of $1,166 million in the 10 years prior to 1958. In the year 1957, Creole re-invested all of the funds obtained from capital extinguishments plus half of its net income from operations. Total capital investment was $261 million, or 84% as large as dividend payments totaling $310 million.

Sinclair Venezuelan Oil Co., another enterprise which publishes separate accounts for operations in that country, had a net income of $10 million in 1957 and made capital expenditures totaling $18 million. The previous year also capital expenditures were higher than net income, earnings being $9.2 million and capital expense $11.6 million.

It is not difficult to foresee what may happen to reinvestments in Venezuelan oil if the new government maintains the junta decree without change. In the interests of stockholders, management will find it expedient to limit capital outlays. One oil company has cabled Venezuela that it must re-appraise its budget in the light of the decree and spend its money in other areas.

Expansion through capital expenditures affects the national economy through employment directly in the industry itself and through employment by contractors engaged in construction and merchants supplying expendables. A drop in capital expenditures in a modern State is quickly reflected in unemployment and a general recession in all lines of business.

The contribution of the oil industry to the income of Venezuela citizens is of great importance. In the 10 years prior to December 31, 1957, Creole paid in salaries and wages $1,030 million, a sum almost equal to the amount spent for capital goods. With 3,737 oil wells, the company had 16,200 employees at the end of 1957, an average of more than four per well.

There is an opportunity for true statesmanship on the part of both Dr. Betancourt and the oil industry leaders in seeking an equitable solution to Venezuela's dilemma—one which will not dry up investment in oil and other industries and which will, in fact, promote the prosperity of the Venezuelan people.

The 1959 Exposition—
A Show Case of Progress

PROGRESS as defined by the dictionary is: "Advancement or improvement of mental, moral, or physical condition." It seems to me that these words are almost synonymous with our oil industry. The petroleum industry is 100 years old this year, and the progress achieved from the crude start made by Colonel Drake on August 27, 1859, makes one wonder if it all happened just 100 years ago.

Introducing this progress and advancement has been the job of the International Petroleum Exposition. It started 35 years ago as a modest trade show—today it has grown to be the world's foremost single industry trade fair. In going over the history of the oil show, it seems impossible that so many things of importance to the industry at large have been introduced here. As a matter of fact, most of the new innovations were seen first by the public at one or another of the petroleum expositions. Steel derricks, mechanical rotary-drilling equipment, portable drilling rigs, slim-hole rigs, electrification equipment, automation machinery, almost all of the geological advances, radio controls, valves, well heads, hydraulic and electric pumping equipment, automatic tools—and on and on—were introduced to oil men and the public at the International Petroleum Exposition.

But more than just showing new equipment to buyers and users and the general public, the biggest contribution of the petroleum exposition is, I believe, presenting the opportunity for all the people of the oil industry to get together and help solve mutual problems.

In an industry which is large enough to be the country's third largest—surpassed only by the automobile and steel industries—problems are bound to arise which cannot be solved by any individual company, regardless of its size. The petroleum exposition gives oil men from all over the world a chance to get together and discuss these problems, both individually and in groups. The exposition doesn't sponsor any forums for this purpose; but inevitably, when oil men get together, the talk gets to industry problems. It's this kind of spontaneous discussion that gets the ideas rolling—out of which come answers to industrywide problems.

When reminiscing about the International Petroleum Exposition, it is almost impossible not to remember the men who have given so much of their time to making it the world's largest single industry show. Two of them have passed away since the last exposition: Earl Sneed, who conceived the idea back in 1922 and made the whole thing possible; and W. G. Skelly, who served as president of the exposition from 1926 until his death in 1957. These individuals contributed more to the oil show than any others who could be named. The exposition and the oil industry will long be indebted to these two farsighted leaders.

The forthcoming show will have as its theme the one hundredth anniversary of oil. In fact, it will be the largest single event commemorating the historic growth of the industry. It seems to me that oil companies and supply firms all over the country should use the exposition and the centennial as publicity vehicles to sell to the general public the fact that oil men are not necessarily all "millionaires," but that we are all good neighbors—both as individuals and companies. Our industry seems to get the bulk of the criticisms along these lines, and we need to utilize every type of selling we can.

The 1959 exposition, with its multimillion-dollar exhibits, its congregation of oil men from all phases of the industry and all levels of authority, its informal socializing and meetings, its sales and its back-breaking work, will be the largest one ever seen. I hope to see you there.

Sincerely,

W. K. Warren
President

Twelve expositions reveal 35-year oil-equipment progress

During more than a third of the oil industry's first 100 years, manufacturers of equipment have displayed their newest developments at the International Petroleum Exposition at Tulsa.

TO REFLECT the progress of the rapidly growing 100-year-old petroleum industry has been the task of the International Petroleum Exposition since it was started 35 years ago.

The vision of a handful of Tulsa businessmen was responsible for the first International Petroleum Exposition. It was conceived as a local affair, and there were more Tulsa merchants and general businessmen on the first board of directors than there were oil men.

For the first exposition, held in 1923, exhibits valued at $10,000 were displayed in improvised buildings along two blocked-off streets near Tulsa's Convention Hall.

It all started in 1922, when the late Earl Sneed and his wife, on an after-dinner stroll, peered into the window of headquarters of the Tulsa Purchasing Agents Assn., which provided space for manufacturers to set up equipment so that the members could see it.

Sneed was then attorney for Roxana Petroleum Corp. (now Shell Oil Co.) in Tulsa. Taking an idea and enlarging it into something more significant was a part of his mental makeup.

Consequently, the Tulsa Chamber of Commerce received a letter which set out

The Hall of Science, which is one of the major highlights of the oil show, will display the technological improvements since the last exposition in 1953 for six divisions of the oil industry. Left to right are: Dean R. L. Langenheim, University of Tulsa; Harry A. Brown, D-X Sunray Oil Co.; John P. Hammond, Amerada Petroleum Corp.; George Roberts, Jr., committee chairman, Pan American Petroleum Corp.; Wm. B. Way, IPE general manager; Theodore R. Aude, Service Pipeline Co.; Kent T. Kimball, committee executive secretary; John Staudt, Dowell, Inc.; R. M. Leader, Phillips Petroleum Co.; Stanley Wilcox, Seismograph Service Corp. and Henry J. Schaetti, Jersey Production Research Co.

the desirability of establishing an exposition. The letter came up at the next meeting of the directors of the Tulsa Chamber of Commerce, and the result was the naming of a committee to determine feasibility of the proposition. So, H. O. McClure, a Tulsa banker; William Holden, then secretary of the Tulsa Chamber of Commerce; and J. Burr Gibbons, who became the second manager of the exposition, started on a mission to sell an idea.

Gibbons, of Gibbons Advertising Agency Inc., puts this cryptic comment on the effort: "We came pretty near not getting it over."

An idea which gets consistent expression finally results in a meeting. So a mass meeting was held, and out of it came a program which called for the holding of the International Petroleum Exposition and Congress. The last word was to cover the open forum, which Sneed had specified in his letter. Later the open-forum part was dropped from the program, and the word "Congress" dropped from the name.

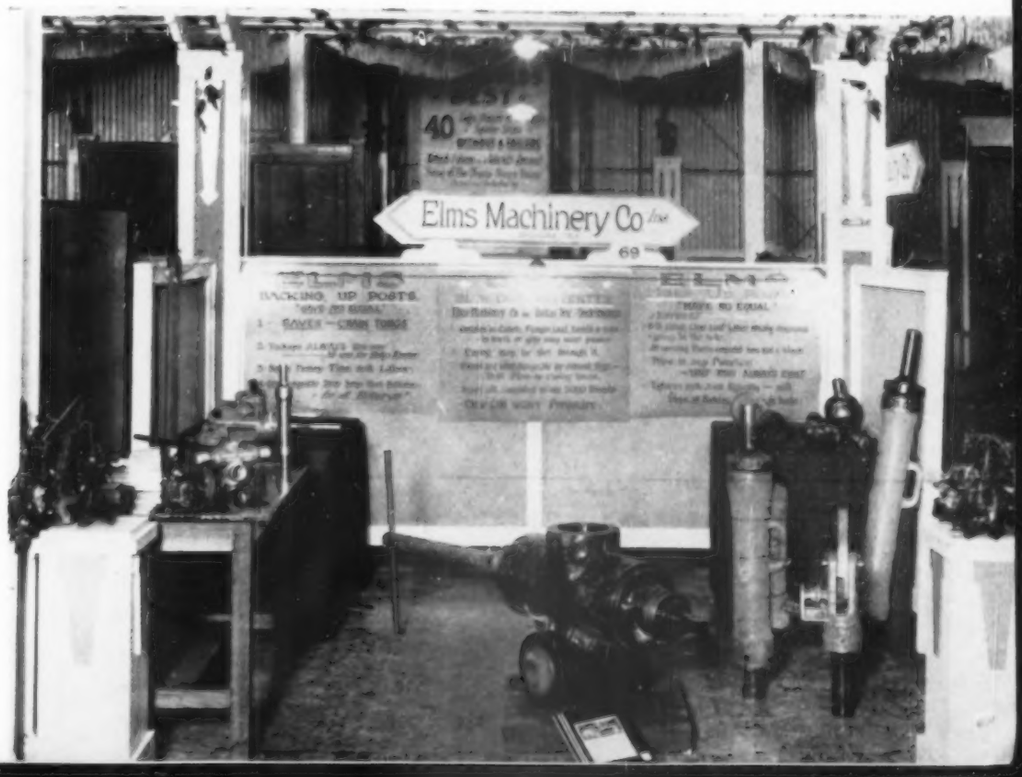
Early in 1923, E. F. McIntyre moved to Tulsa to become the first general manager of the exposition. He was manager, publicity man, space seller, space designator, and money collector.

In the estimate of that day it was an elaborate affair which opened October 8, 1923. The display was something on the fashion of a street bazaar for street space had been taken over near the Convention Hall, booths built along the sidewalk, an entrance provided, a parade held—and the show was on.

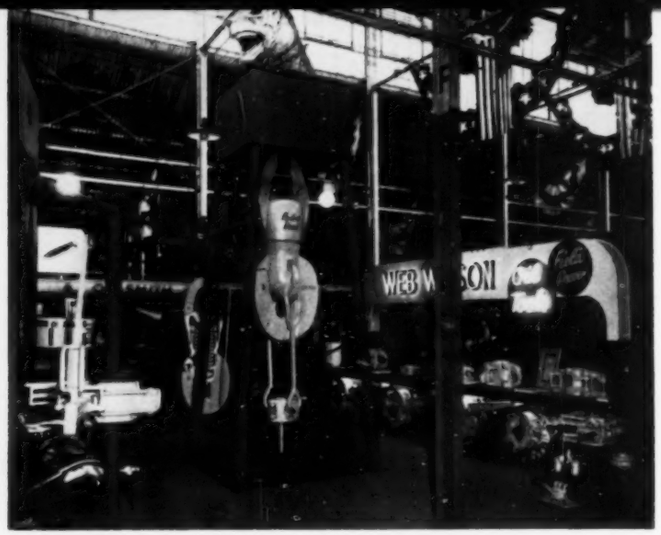
The present estimate is that from 25 to 50 manufacturers had $10,000 worth of equipment on display. There was no check of attendance. The rain is the one thing that made a lasting impression. It looked like a one-show affair. But someone had been thoughtful enough, lucky enough, or had lost sales resistance when an insurance man came along with protection against unfavorable weather.

Returns from the insurance company paid all bills, and the first International Petroleum Exposition and Congress was a success because it was not a financial failure.

So there was a resolution adopted to the effect that it be an annual affair. J. Arthur Hull, J. K. Crawford, W. G. Skelly, D. F. Connelly, and J. H. Markham, Jr., were the committee which drafted the resolution.



Display of blowout preventers and packers at one of the early Tulsa expositions.



L. B. Jackson, an independent oil producer in Tulsa, continued as president, and McIntyre as manager.

For the second exposition, October 2 to 11, 1924, a larger site was taken on land and buildings owned by Prairie Oil and Gas Co. There were 86 exhibitors and 27,000 estimated in attendance for the second show.

Presence of so many exhibitors was evidence of growing interest in the oil industry. While the second show was in progress, manufacturers decided the industry should have more extensive representation on the board of directors. They also questioned the wisdom of holding a show each year.

But the third exposition opened, October 1, 1925, and continued through October 10. A sample of its success was the attendance of 38,512, while 37 of the 102 exhibitors reported sales amounting to $2,005,970.

The agitation for less frequent shows resulted in none being held in 1926. W. G. Skelly had been elected president and held the post until his death in 1957. J. Burr Gibbons was selected as general manager. A permanent site of 16 acres southeast of the city was leased from the Tulsa State Fair, and the job of getting buildings erected and grading done was started.

The dates selected for the 1927 show were from September 24 to October 1. It rained five days, and merchants of Tulsa were without rain coats, boots, and overshoes long before it stopped. The show was continued through October 2, and the last day brought weather of the sort to take away the sting of rain.

All amusements were discarded for this show. So was the open forum. It was to be strictly an affair for the maker of equipment and the buyer of equipment.

Despite the rain, the show was outstanding with 189 exhibitors and an attendance of 67,832.

A search for "Old Timers" was instituted, and the late John D. Rockefeller, Sr., gave gold medals to oil pioneers. These medals were presented at the 1927 exposition.

For the fifth show, October 20 to 28, 1928, the plant was expanded by building the office, adding to the Scientific and Oklahoma buildings. Charles M. Schwab, chairman of Bethlehem Steel Corp., came to make the opening address. There were 258 exhibitors and 89,316 paid admissions.

After the 1928 exposition, J. Burr Gibbons resigned as manager. William B. Way was induced to take the post; and the 1929 exposition, one of the outstanding shows, was under his direction.

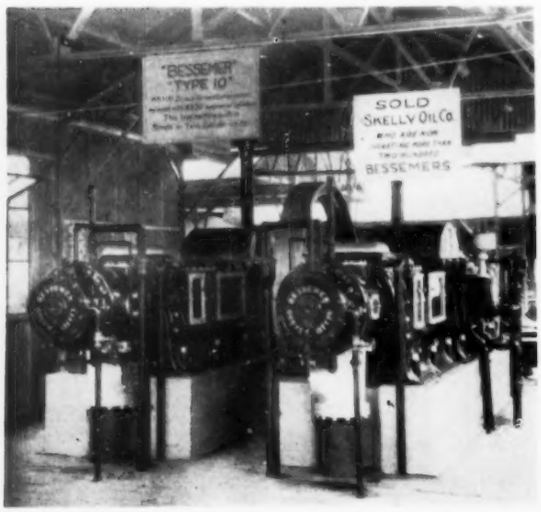
Attendance that year hit 100,314—a record. All space indoors and out was taken by 289 exhibitors. Evidently Robert P. Lamont, Secretary of Commerce, did not think the depression would be disastrous, for as the speaker to open the 1930 exposition, October 11, he said in reference to the depression: "Make sure of this. We shall emerge from this depression more efficient than when we entered it."

It may have been true also that someone had been talking of control of the industry, for Lamont said on that point: "There is little the government can do to overcome conditions. Help must come from within the industry."

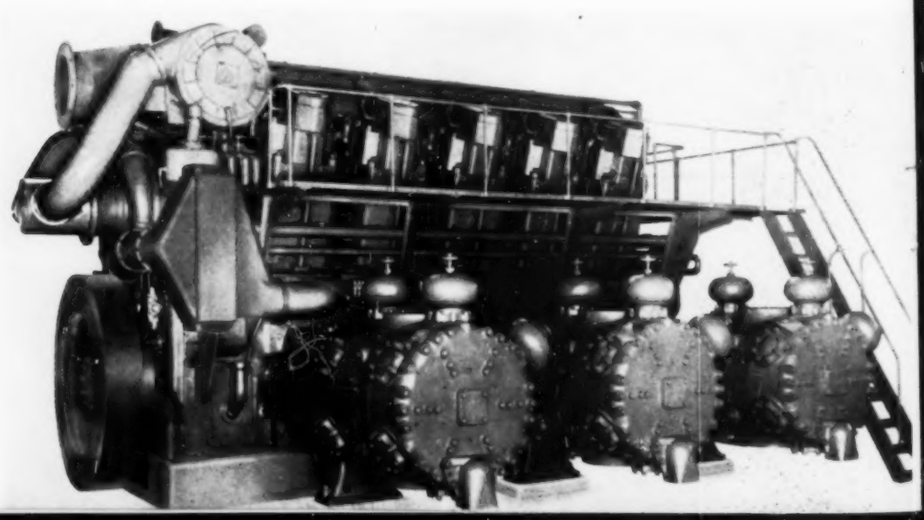
Pat Hurley, citizen of Tulsa and Secretary of War, added: "Don't sell Tulsa short. Don't sell Oklahoma short, and don't sell the United States short."

There were 312 exhibitors and 112,605 in attendance.

The 1934 show was held in the spring, May 14 to 21. When plans were being made, some directors thought it would be best to close some of the buildings, as there were five on the grounds. William B. Way thought this might not be necessary. The show was



At left 10-165 hp Bessemer compressor sold to Skelly Oil Co. at the first Tulsa oil show still is in operation after a quarter of a century. Contrasted with it is the company's current 10-cylinder V-type compressor with an 18 in. bore and 20 in. stroke rated at 3,500 hp. shown below.



A group of officials and visitors at the 1927 International Petroleum Exposition at Tulsa: In the front row at the left is J. Burr Gibbons, then manager of the show. At his right is Carl Young, formerly head of the production division of the American Petroleum Institute. Slightly behind him is E. J. Nicklos, then an official of The Texas Co. The late J. Edgar Pew of Sun Oil Co. is third on the left in the front row; and the late William Skelly, president of Skelly Oil Co., is fifth from the left in the front row. Mr. Skelly was president of the exposition for many years.

a success. There were 326 exhibitors and an attendance of 121,398.

By 1936, conditions within the industry left no doubt of the success of the Ninth International Petroleum Exposition, which was held May 16 to 24. W. A. Irwin, president of the United States Steel Corp., was the speaker to open the affair. Overproduction and proration had become such common conditions that they no longer made news. The exposition of 1936, with its 397 exhibitors and an attendance of 152,011, looked like progress in that it reflected the revival of profit within the industry.

By May 1, 1938, exhibitors exceeded 500 for the 15th anniversary of the founding of the exposition and its tenth opening before the industry. Well before that, however, the exposition management decided to expand its permanent site. Accordingly, 150 ft of space across the east side of the grounds were taken in by moving the fence to the property line. The new cafeteria was built in the northeast corner of the grounds, a new street cut across the grounds. The office was enlarged; a new Kansas building was added, the Oklahoma building was enlarged. All told, 50% additional space was provided. The old Scientific and Technical Building was converted to exhibit space, while a new Hall of Science was provided by securing a building of the Tulsa State Fair Assn.

Many innovations were presented at the 1940 oil show, including a new jackknife rig which could be assembled in one day and raised into position in three minutes. Machines developed to cover a variety of jobs gave way to the adaptation of more highly specialized equipment for specific jobs. Expansion and enlargement of the exposition plant and exhibit facilities included an exhibitor's lounge, 11 new exhibitor-owned buildings, a new NOMADS International Headquarters building, and addition to the Hall of Science to provide more exhibit space and a motion-picture projection room for showing educational films.

Even with complications brewing on the international scene, 25 nations were represented at the May 18 to 25 exposition. A total of 194,491 persons entered the gates of the 11th oil show, and they viewed the products and services displayed by 628 exhibitors.

An exposition was planned for 1942, but World War II caused the board of directors to postpone it.

Shortly after production had returned to relative normalcy, the Silver Anniversary Exposition was scheduled for May 15-22, 1948. Another three acres of exhibit space were acquired, and the show featured the displays of 1,156 commercial firms. A record attendance of 300,114 proved the exposition's value; delegates from 43 nations were among the visitors.

May 14 to 23, 1953, saw the tradition of continual growth of the show carried out. Over 500,000 people came through the gates and visited a record 1,484 exhibits valued at over $100 million.

Again, the world's largest and world's most of just about everything in the oil industry was displayed. For the first time, the women got into the act. The "Oil Woman of the Year" was selected. She was Ernestine Adams, managing editor of the *Petroleum Engineer*.

The Hall of Science continued its stand as one of the show's most popular exhibits. Petrochemicals, geologic time tables, technical drilling developments, and transportation advancements were among the many exhibits in what was recognized as the world's foremost museum of science and industry devoted exclusively to petroleum and its products.

General Manager William B. Way remarked on opening day: "Next time we have an oil show we'll have to go some to beat this one—but we'll try." END

IPE Nomad committee tries out the newly redecorated and furnished headquarters on the show grounds of the International Petroleum Exposition. The building will be headquarters for all overseas visitors during the 10 days of the show. Left to right are Oscar B. Irizarry, Petroleo Interamericano, president; Arch F. Campbell, headquarters manager; Don L. Collins, Republic Supply, IPE committee chairman; H. M. Cooley, Bethlehem Steel; Ken O. Hoevel, National Supply; R. C. Glover, Baker Oil Tools; Bill Davidson, W. C. Norris, and Gilbert Swift, of Well Surveys Inc.

NOMADS

to entertain overseas visitors

Overseas visitors to the International Petroleum Exposition can expect the best of treatment according to Don L. Collins of Republic Supply Co. and IPE NOMAD chairman. The NOMAD building on the grounds has just been redecorated and new furniture installed. Arrangements are now complete to have interpreters on duty to handle any language difficulties and all travel accommodations can be made directly from headquarters. Teletype service will be available.

The traditional cocktail party honoring international visitors has been set for Wednesday, May 20, at Southern Hills Country Club. Mr. Collins says that he expects to host more than 3,500 at the party. Tickets can be purchased through any member of the National Oil Equipment Manufacturers and Delegates Society.

Because of the size of the party, it will be held on the country club lawn and a rain check has been provided in case of inclement weather.

As at previous shows, there will be no formal tours for international delegates; but anyone desiring to visit any of the oil installations in the area can do so by contacting NOMAD headquarters. In addition, anyone desiring to make a trip to any other city may make arrangements through the NOMADS.

Tentative arrangements have been made for the designation of one of the downtown hotels as International Headquarters. The name of the hotel will be announced when plans are completed. A key man from each delegation will be assigned to the headquarters hotel so that any emergency that might arise can be handled. Interpreters will also be on duty at the hotel.

The list of delegates from other countries continues to grow and all indications are that the number will more than triple that of the 1953 show when 784 international delegates registered. Requests for housing have been received from the following countries: Germany, France, Italy, England, Belgium, Trinidad, Algiers, Cuba, Argentina, Brazil, Venezuela, Colombia, Peru, Mexico, Canada, Guatemala, Iraq, Austria, Saudi Arabia, Portugal, Chile and Bolivia. In addition, attendance is assured from Indonesia, Sumatra, Japan, China, India, Russia, Egypt, Morocco and Pakistan.

Mr. Collins reports that at least four automobiles with drivers who know the city will be on hand during all open hours of the show and will be available to any international delegate needing them. At least one member from each of the five NOMAD chapters in the United States will be on duty in the headquarters during the exposition.

Homes to supplement hotels for exposition housing

THE International Petroleum Exposition Housing Bureau is a liaison between IPE exhibitors and visitors and the hotel and home owners of Tulsa. Since the large attendance in Tulsa taxes the available hotel space, it has long been the practice for local home owners to lease their homes for the duration of the show to the oil-industry visitors. From 2,000 to 2,500 homes will be listed, accommodating groups from four to as many as 20 men in one home. Tulsa home owners willingly accept this civic responsibility, and many new and some of the finest homes in the area are on the available list. The Tulsa Hotel Assn. has turned all the available rooms and suites over to the bureau, and reservations are handled on a first-come first-served basis. A limited number of hotel rooms have been reserved for overseas visitors, since exposition officials realize the time problems involved in planning a trip to the United States from other countries. These rooms are also listed on a first-come basis after February 15.

All requests for accommodations should be made by letter or cable to the IPE Housing Bureau. Address is: S. J. Raphel, manager, 214 Oil Capital Building, Tulsa, Okla. Cable address is: "OILSHOW, TULSA."

Companies desiring to lease homes for the show should list their requirements as to number of men to be accommodated, convenience to the exposition grounds, or the downtown area; whether or not air-conditioning is required, and desired price range. Homes are being rented at an average rate of $8 to $10 per bed per night, with only one person to a bed and not more than five men to one bath. Choice locations and accommodations may run to $12 per bed per night. Other homes distant from the grounds and with average accommodations may be priced at the $8 figure. In the case of the overseas visitors, the bureau will select a home according to a written request for such service, giving requirements in detail and all information. The lease will be submitted back to the company together with an indemnity bond for the protection of both the rentor and the home owner. The lease is complete when the company signs and returns it to the housing bureau.

For the company or individual who desires to stay less than the 10 days of the show and does not require an entire home, the bureau will have on file several thousand private rooms to supplement hotel accommodations. These rooms can be rented for any number of days during the show, and can be secured as late as the day of arrival in Tulsa. The housing bureau will have direct wire telephone connections from all transportation terminals to the hotels and the bureau headquarters. Any visitor arriving in Tulsa during the show will be able to obtain suitable accommodations within 30 minutes of his arrival.

It is suggested companies having United States representatives send these representatives to Tulsa if possible so personal inspections of the homes may be made.

Motels in the area are not listed with the housing bureau and, therefore, reservations cannot be handled by the exposition. For many months all of the motels have been leased. END

289 papers scheduled for Fifth World Petroleum Congress

With the Fifth World Petroleum Congress only three months away, final touches are being put to the meeting's detailed plans which are the culmination of two years of organizational effort.

The Secretariat in New York reports that worldwide interest in the meeting is running high and a record attendance of top-flight executives, scientists, and engineers is expected. An indication of this is that nearly 10,000 inquiries for information on the meeting and the exposition, an integral part of the congress, have been processed over the past four months.

Space in the exposition, occupying 150,000 sq ft on the first two floors of New York's Coliseum, where the week-long congress is convening on May 30, is being rapidly taken up by petroleum equipment suppliers and services and oil and chemical companies. Only some 30% remains to be allocated. While the majority of exhibitors are located in the United States, space has also been taken by German, French, British, Italian, Swedish, and Dutch companies.

Congress technical editors have been reviewing papers for presentation since early December as they have been received from authors around the world.

The preparation of preprints from the papers is a considerable publishing undertaking which it is expected will involve the printing of six million pages. The size of the task and the time estimated to complete it make it impossible for copies of papers to be available for general distribution more than a few days before the congress convenes, but it is intended that abstracts of the 289 papers to be presented will be circulated in booklet form in April to all who have registered in advance by mail. The booklet will be published in the two official languages of the congress, English and French.

The vanguard of the congress organization will be moving into the Coliseum on Wednesday, May 27, and then will follow a period of intense activity during which 11 meeting rooms, exposition and other facilities will be constructed. The meeting rooms will have seating capacities ranging from 350 to 550, and will be located on the third and fourth floors. The first and second floors will be occupied by the exposition.

Twelve industry tours, organized in conjunction with the congress, will be conducted prior to and following the meeting. These will take in research laboratories, exploration and production sites, atomic energy installations, refineries, and storage facilities in 13 states. A large proportion of the cost of these tours may be paid in local currency by those attending the congress from abroad.

Invitations are now going out to oil scientists and engineers in 22 countries to undertake nearly 500 congress assignments of particular responsibility.

Many of these oil men, all leading figures in the petroleum industries of their own countries, are being asked to become chairman or vice chairman of the 100 scheduled technical sessions. Others will open discussions on the 289 papers to be given at the sessions.

Program for the congress is divided into 10 sections. In the following list is shown the number assigned to each paper, its title, author or sponsoring organization, and the country submitting the manuscript. Papers marked with an asterisk will be printed only in French.

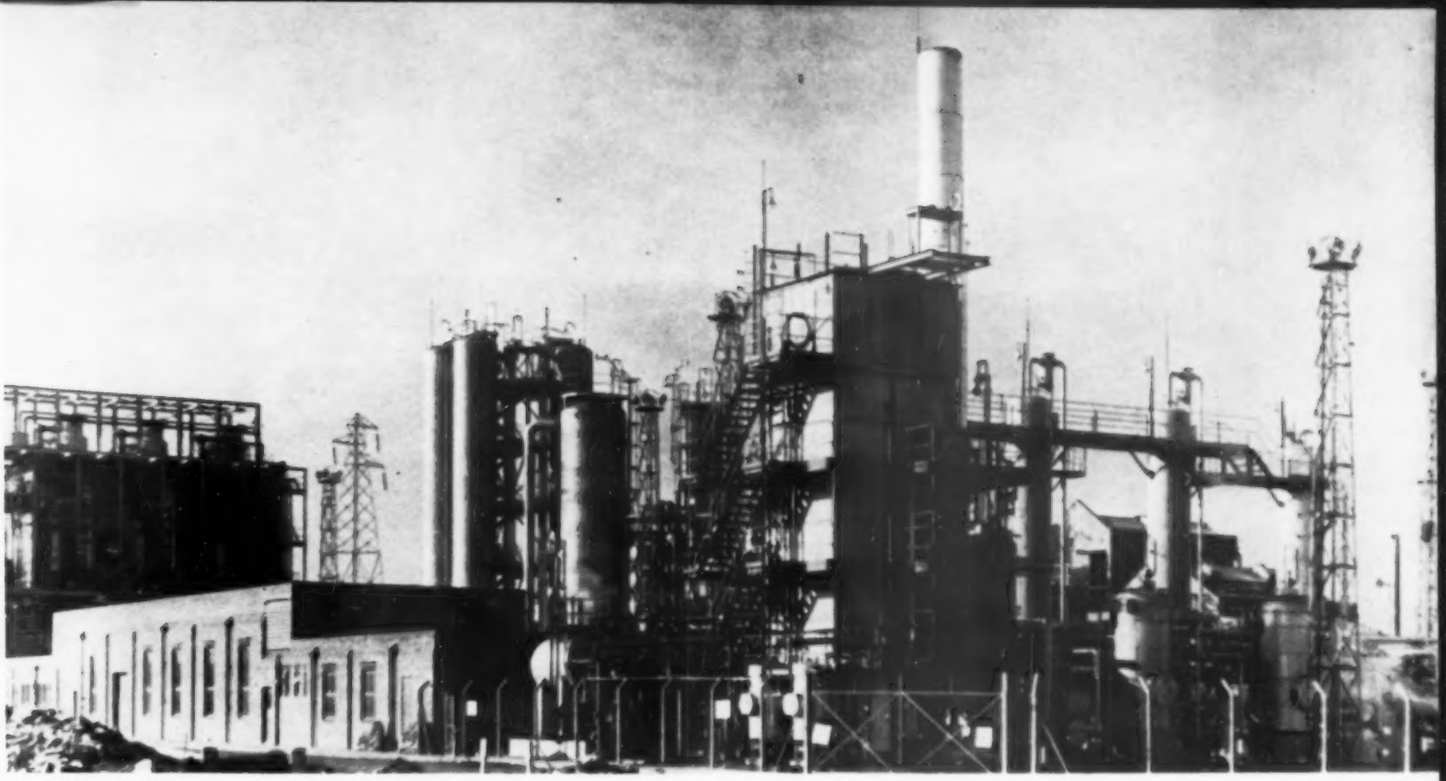
SECTION I—GEOLOGY AND GEOPHYSICS

Sponsoring Directors: Ira H. Cram; USA. Program Committee Member: Dr. H. D. Hedberg.

1. The Gulf of Batabano, a Modern Carbonate Basin. Jersey Production Research Co. USA.
2. Deposition and Diagenesis of Some Upper Paleozoic Carbonate Sediments in Western Canada. L. V. Illing. Canada.
*3. French Contribution to the Study of Dolomitization. a. Experimental Research. b. Research Regarding the Phenomena of Dolomitization Having a Structural Origin. c. Dolomitization and Properties of the Reservoir in the Parentis Field. Institut Francais du Petrole; Societe Esso de Recherche et d'Exploitation Petroliers. France.
4. The Structural Development of Northwest German Salt Domes and their Importance for Oil Accumulation. Amtes fur Bodenforschung. Germany.
5. A Geological Appraisal of Present and Future Exploration Techniques on Salt Domes of the Gulf Region of the United States. Michel T. Halbouty Oil and Gas Interests. USA.
*6. Saliferous Tectonic of the Cuanza Basin (Angola). Companhia de Petroleos de Angola. Portugal.
7. Role of Evaporites in Petroleum Geology. Northwestern University. USA.
*8. The Migration of Oil in an Oilfield in Relation to its Original Formation. Societe des Petroles d'Afrique Equatoriale Francaise; Institut Francais du Petrole. France.
9. Migration of Oil in the Gifhorn Trough, Northwest Germany. Deutsche Erdol AG. Germany.
10. Geochemical Analysis of Oils and Asphalts. Institut Recerche Donigami. Italy.
11. Gela in Sicily—An Unusual Example of an Oilfield. Agip Mineraria. Italy.
12. The Regusa Oil Field, Sicily. Gulf Italia Co. USA.
13. Evidence on Slump Phenomena (Olistrostomes) in Areas of Hydrocarbon Exploration in Sicily. Gulf Italia Co. Italy.
14. The Geology of Oman and Hadhramaut. Iraq Petroleum Co., Ltd. Gt. Britain.
15. Oil Possibilities in the Sedimentary Basins of Turkey. Mineral Research & Exploration Institute of Turkey. Turkey.
16. Petroleum Possibilities of Israel. Professor L. Y. Picard. Israel.
17. The Main Sedimentary Basins of Iran and their Oil Prospects. Iran Oil Co. Iran.
18. The Geology of the Gach Saran Oilfield, Southern Iran. Iranian Oil Exploration and Producing Co. Iran.
19. Stratigraphy of Lower Indus Basin. Pak-Stanvac Petroleum Project. Pakistan.
20. Petroleum Exploration of California Offshore. California State Lands Commission. USA.
21. Geology and Petroleum Development of the Continental Shelf of the Gulf of Mexico. Gordon Atwater. USA.
22. The Petroleum Potential of the Emerged and Submerged Atlantic Coastal Plain of the United States. U. S. Geological Survey. USA.
23. Petroleum Exploration in the Future. A. I. Levorsen. USA.
24. Withdrawn.
25. Eu-Geosynclines as Potential Oil Habitats. N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.
26. The Geology and Development of the Bolivar Coastal Field, Maracaibo, Venezuela. Creole Petroleum Corp. Venezuela.
27. Petroleum Geology of the Four Corners Area. Shell Oil Co. USA.
28. Specific Features of the Geological Structure of Flat Bed Regions in the Soviet Union in Relation to their Oil and Gas Saturation. Professor M. F. Mirchink et al. USSR.
*29. Geophysical Exploration of the Central Congo Basin and its Interpretation. P. Evrard. Belgium.
*30. French Equatorial Africa Oilfields. Societe des Petroles d'Afrique Equatoriale Francaise. France.
31. Sedimentation of the Multibillion Barrel McMurray Oil Sands of Alberta, Canada. Research Council of Alberta. Canada.
32. Geology of the Maquia Oilfield in Eastern Peru. Sociedad Geologica del Peru. Peru.
33. Progress in Geophysical Methods for Prospecting for Oil and Gas in the USSR. Professor Y. N. Godin et al. USSR.
34. The Use of Amplitude and Frequency in Exploration Seismology. The British Petroleum Co., Ltd. Gt. Britain.
35. Review of the Progress of Well Logging Since the Fourth World Petroleum Congress. Schlumberger Well Surveying Corp. USA.
36. Investigations into Direct Oil Detection Methods. Professor V. A. Sokolov et al. USSR.
37. Absolute Age Determination of Sedimentary Rocks. Lamont Geological Observatory. USA.

*To be presented in the separate one-day symposia on these subjects and printed as part of Section I.

(Continued on page 76)



Laporte Chemicals' Warrington plant: General view from the east.

World's largest peroxide fuel plant

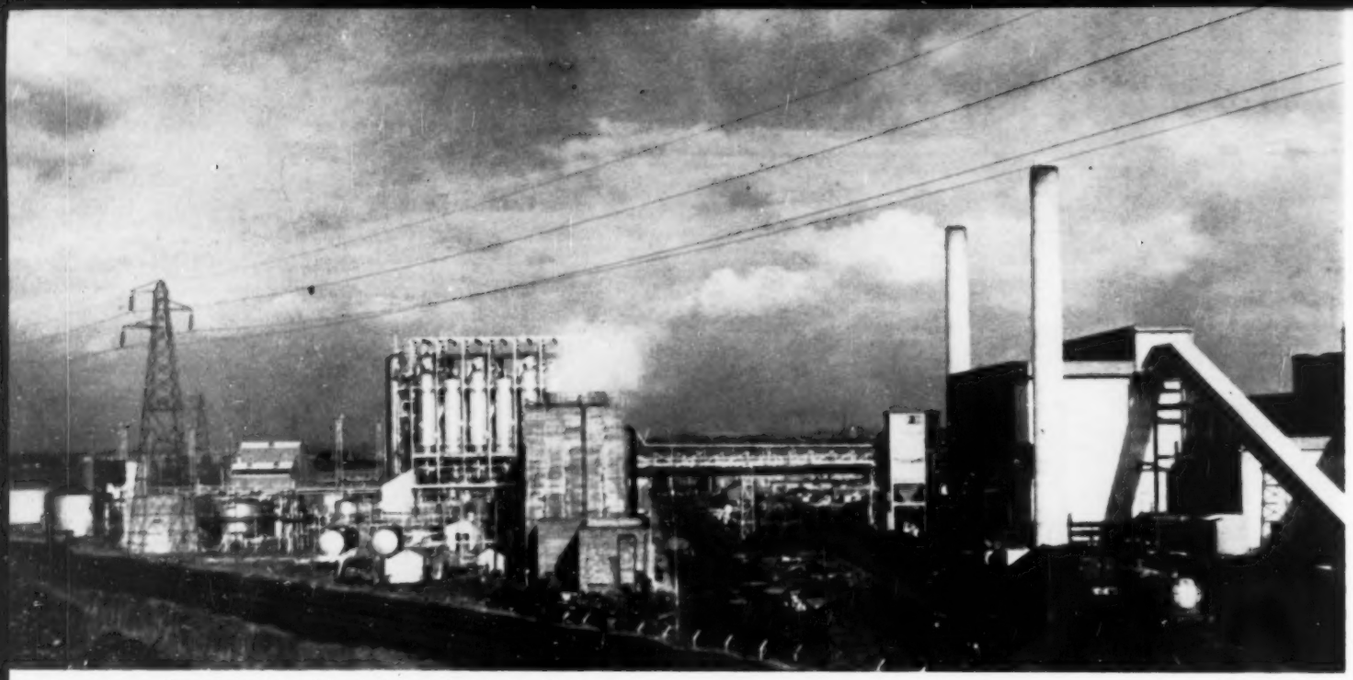
First hydrogen-peroxide plant in the UK produces oxidant for rocket motors and polymerizing agents for plastics. Hydrogen from cracked butane is basis for catalytic conversion using organic intermediates.

LAPORTE Chemicals Ltd., subsidiary of the 50-year-old Laporte Industries group, has recently opened at its Baronet works, Warrington, the only chemical plant of its kind in the United Kingdom, and probably the largest in the world, to provide high-test peroxide fuel for rocket motors and guided weapons. Built at a cost of about £2.5 million, this plant will help Laporte to double its output of this important fuel, now in increasing demand for propulsion purposes, being used by Laporte for the manufacture of polymerizing agents used in the manufacture of plastics.

For propulsion purposes, hydrogen peroxide is primarily used as an oxidant in the bipropellant hot-rocket motor. It is, however, a fuel in its own right, and may be used in so-called "cold" rocket motors, such as the DeHavilland "Sprite"-assisted takeoff motor, by being passed through a gauze decomposer. The DeHavilland "Super Sprite" rocket unit is a selfcontained pressure-fed-assisted takeoff unit using kerosine or gasoline as the fuel and high-strength hydrogen peroxide as the oxidant.

The main contractors for the plant were the APV Co. Ltd. and Matthew Hall and Co. Ltd., and some points of engineering and construction interest follow. The plant is almost entirely in the open, and the chief material of construction is aluminum. The major vessels are probably the largest ever fabricated in aluminum, comprising some up to 80 ft in height and 12 ft in diameter. Corrosion is minimized by separating, wherever possible, the aluminum columns and piping from contact with foundations and mild-steel structures by the use of PVC sheet and roofing felt.

All joints are argon arc-welded; and this involved special techniques, as the wall



General view from the west of the hydrogen-peroxide plant.

thickness of some of the vessels exceeded $1\frac{1}{2}$-in. A special type of packing has been used on the stainless-steel valves on the solution systems, which minimizes loss of expensive solvents and virtually eliminates gland maintenance. Where there is catalyst in the system, Y-valves with seal wiping mechanisms made by Joshua Hindle and Sons Ltd., Leeds, are used.

The compressors supplying air for the oxidation stage, furnished by James Howden and Co., Glasgow, are high-speed rotary machines running with fine clearances between rotor tips and casing. Drive speed is 1,480 rpm, raised through a speed-increasing gear box to a rotor speed of 5,880 rpm. These machines can deliver over 3,000 cu ft per min at 40 psi delivery pressure.

Hydrogen is made by cracking butane obtained from the Shell refinery at Stanlow in a plant supplied and erected by the Power Gas Corp. Ltd. The hydrogen compressors are single-stage double-acting dry-cylinder machines fitted with gas-proofed auto-governors and unloading equipment, and carbon piston rings and carbon glands on the piston rods. These machines, supplied by Broome and Wade Ltd., are capable of delivering about 400 cu ft per min at 50 psig delivery pressure. Nash Hytor compressors, in cast iron with liquid seals, are used for hydrogen recycling, being capable of delivering about 400 cu ft per min at 35 psig.

There are 14 Bryon Jackson pumps, supplied by Hayward Tyler and Co., for solvent circulation, and these are fitted with Flexibox mechanical seals. LaBour self-priming centrifugal pumps, constructed in aluminum alloy, are used throughout for pumping hydrogen peroxide.

The plant for recovering solvent from the oxidizer off gas, supplied by British Ceca Co. Ltd., consists of four vessels packed with activated carbon: Two are on line at a time, the others being reactivated by a process of repeated steaming.

Some other contractors mentioned as being on site during the construction were: Babcock and Wilcox Ltd.; J. R. Bramah and Co. Ltd.; Head Wrightson Processes Ltd.; William Kenyon and Sons Ltd.; London Aluminium Co. Ltd.; Musgrave and Co. Ltd.; Newalls Insulation Co. Ltd.; W. and H. Nelson Ltd.; Permutit Co. Ltd.; Pearson and Knowles Engineering Co. Ltd.; C. A. Parsons Ltd.; Wiggins and Co.; Fred Watkins (Boilers) Ltd.; J. Young and Co. Ltd.

Instrumentation and control from a central panel in a special airconditioned services block is of a most extensive character, and the total installation cost—materials, instruments, and labor—was £75,000. Pneumatic instruments have been used wherever possible owing to the flammable nature of the plant operations, and flow metering is by differential-pressure transmitters, using orifice plates as primary elements. Instrument air distributed at 75 psi is dried by activated alumina, and has a dew point lower than any atmospheric temperature likely to be met in the area.

All diaphragm-operated valves above 2-in. are fitted with valve positioners. Conventional 3-way control valves with quick-acting characteristics are used for certain purposes, but these are driven by power cylinders instead of diaphragm motors. All control valves are fitted with PTFE glands.

Extensive use has been made of multicore copper tubing, mounted on polythene-covered cable trays, for instrument air lines. Oxygen content in the gas phase in various parts of the plant is critical, and seven oxygen analyzers are employed. These are of magnetic-wind type and vary in range from 0% to 20% oxygen in nitrogen to 0% to 3% oxygen in hydrogen. Potentiometric instruments record the value.

Plant experience so far indicates maintenance is not likely to be a very serious problem, and it is expected the whole of this plant will not require more than two extra mechanics in the factory's instrument shop.

An interesting use of an EMI Ltd.'s EMIAC Ltd.'s EMIAC-I analog computer was made during the design stage, after control schemes and vessel sizes, etc., had been determined. A project worked out between Laporte and EMI was aimed to give: (a) confirmation that vessel capacities would be sufficient for all expected major flow changes, including startup and shutdown; (b) determination of optimum control settings of automatic controllers; (c) confirmation that no interaction, which might lead to sustained hunting, would occur between various vessels and controllers; and (d) determination of points of particular sensitivity to oscillatory disturbances.

Attention was concentrated on mass liquid flow round the circuit, and an exhaustive series of tests gave the following information: (1) confirmation that there would be no serious interaction between the various automatic controllers, i.e., the plant as a whole would be stable; (2) figures for optimum settings of controllers; (3) information that vessel sizes were sufficient in conjunction with optimum control settings to take expected throughput changes; (4) information of the time it would take the plant to settle down after major disturbances; (5) knowledge that periodic disturbances are unlikely to be of frequencies which would lead to hunting throughout the plant; and (6) that oscillations introduced by hunting of gas-phase controllers were unlikely to be of a frequency which would induce hunting on the whole plant.

It has not been possible as yet to determine the degree of accuracy of the figure from the computer so far as plant response times are concerned; but, as the plant did, in fact, not give any unexpected trouble during startup, it is believed the numerical information is at least reasonably accurate.

The increasing interest in hydrogen per-

oxide since 1954 has led to much research on alternative manufacturing methods to the original electrolytic route. Laporte Chemicals has been among the most active workers in this field; and attention has been concentrated mainly on the use of organic intermediates, particularly substituted anthraquinols, which autoxidize to form hydrogen peroxide.

The process developed by Laporte is based on the use of 2-ethyl anthraquinone, with the hydrogen made by cracking butane. In the presence of steam and a catalyst, the butane yields hydrogen and carbon monoxide: The latter is removed by reacting with steam over a catalyst forming hydrogen and carbon dioxide. The carbon dioxide, removed by scrubbing with monoethanolamine, is used as required as a purge gas in the autoxidation process. The hydrogen is passed over a catalyst, when the carbon-monoxide content is further reduced with formation of methane, and then compressed for use in the process.

The autoxidation-process organic cycle consists of two identical units which operate in parallel up to the extraction stage where solution from both streams mixes.

Hydrogenation is carried out in vertical vessels using palladium on an inert support in free suspension as the catalyst, this being manufactured on the site: The catalyst is suspended using a stream of hydrogen which is passed through the reactor in excess of the theoretical requirement, the excess being recirculated together with fresh hydrogen. Catalyst is added to the reactor at the rate necessary to maintain the required rate of reaction. Hydrogenated solution passes through filters which retain the catalyst in the hydrogenator.

As both the hydrogenation and oxidation reactions are exothermic, the filtered solution is cooled before passing to the oxidizers. These are vertical vessels, and solution and air are fed to the base so that flow is concurrent: The gas-liquid mixture leaving the top of the reactor is separated, excess air passing through active-carbon beds for recovery of evaporated process solvents passing to atmosphere.

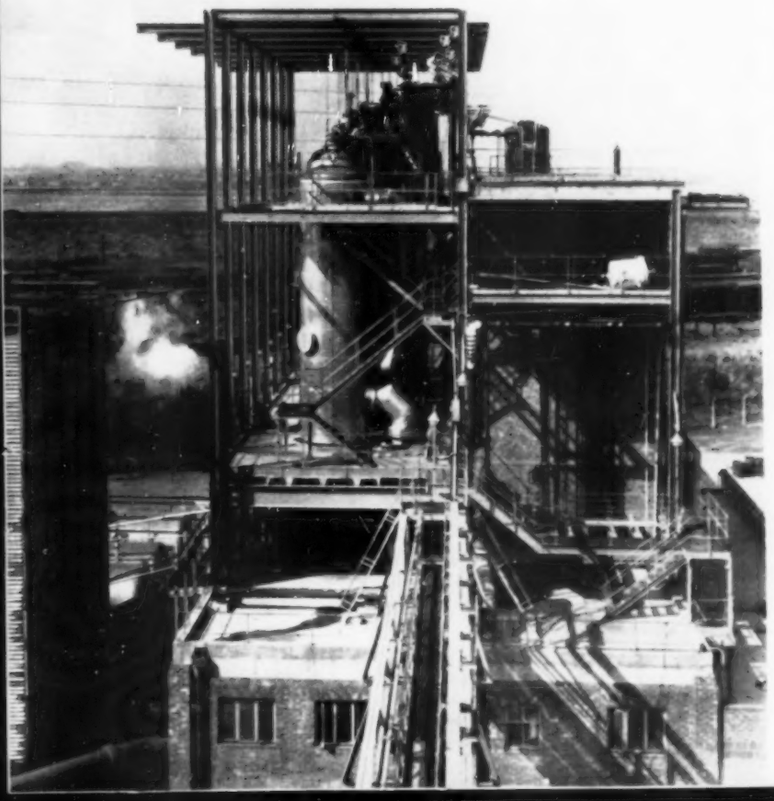
Hydrogen peroxide is extracted from the organic solution using countercurrent flow in columns fitted with perforated plates. As the organic solution is less dense than water, it is fed to the base of the columns. The aqueous feed is de-ionized water, prepared with mixed resin-bed exchange units, to which a stabilizer and corrosion inhibitor are added. The aqueous product, which is withdrawn at a constant rate, contains approximately 20% hydrogen peroxide; after passing through a treatment stage for removal of dissolved organic compounds, it is held in rundown tanks for checking of quality. The extracted organic solution passes to a storage tank before being returned to the hydrogenator. The process is thus continuous and cyclic.

The 20% hydrogen peroxide may be used directly for certain purposes, but it is normally further purified and concentrated to 50% to 90% hydrogen peroxide by distillation. Distillation is carried out on a site adjoining that of the organic cycle, and again the plant is largely in the open. The vaporizers are of the vertical tube-and-shell type with recirculation, the vapor-liquid mixture passing to a separator. The vapor is fractionated in a column using direct reflux, the columns either being fitted with West plates or packed with ceramic rings, to yield a product with a concentration maintained at the desired level in the range 50% to 70% hydrogen peroxide. The overhead product, substantially water vapor, is condensed using jet-spray condensers. Distillation is carried out at reduced pressure, the pressure being maintained using steam ejectors.

Part of the production from these stills is purified further and converted to 85% to 90% hydrogen peroxide (high-test peroxide, or HTP). Hydrogen-peroxide solutions are delivered from site in 99.5% aluminum rail tankers, or by road in smaller containers.

END

Distillation plant at Warrington.



Night view of hydrogen plant at Laporte Chemicals' Warrington hydrogen-peroxide works. (Note: All photos in this article by courtesy of Laporte Chemicals Ltd.)

World petroleum market trends

by D. Spriggs

- *Crude Surplus*
- *USA Market Isolation*
- *Soviet Oil Exports Grow*

FUNDAMENTAL changes are affecting international oil markets. These related changes are: (1) The United States oil market is being isolated increasingly from marketing conditions in foreign areas as a result of successive tightenings of the U.S.A. oil import control program, (2) New and prolific sources of crude oil have been located abroad by American oil companies which have little or no previous experience in world distribution, marketing, and trade and which are seeking to gain that experience rapidly. (3) Efforts are being intensified by the Soviet Union to expand outlets for Russian oil exports in the free world.

The fact that these various developments have coincided at the same time has resulted in a marked intensification of competition in world oil marketing. Indeed, seldom before in the post-World War II period have so many major developments affecting the basic economics of international oil marketing operations occurred within such a short interval of time.

Since the early days of the oil industry, a close relationship has existed between prices and other market factors in the United States and abroad. The nature of this relationship began to change during the post-World War II period, first, as the importance of U.S.A. oil export flows to foreign areas diminished and, second, as the United States became a net oil importer and drew increasing oil supplies from overseas. Efforts to place an effective ceiling on the flow of imports into the U.S.A. markets represent a third milestone in the evolution of this relationship.

The more effectively the U.S.A. market is sealed off from foreign oil, the less direct is the relationship between prices and other market conditions at home and overseas apt to become. Already oil prices in the Caribbean and the Persian Gulf have shown movements independent of those at the US Gulf, the primary cargo market in the United States. This development would be stimulated by either mandatory import controls or by a voluntary control program with a high degree of industry acceptance.

Under such circumstances, oil prices in foreign areas and those in the United States would tend to reflect increasingly the costs, risks, and other marketing factors peculiar to the two areas. As the isolation of the United States increased, domestic oil prices would be expected to reveal somewhat greater stability, unless, of course, the flow of crude oil from domestic fields were increased in excess of the market's ability to absorb supplies. In foreign areas, competitive pressures would probably intensify.

In foreign markets, competition from two new sources of supply has already become evident from companies, mostly USA firms, with newly established oil reserves overseas and from the oil-exporting authority of the Soviet Union. The American companies are made up mainly of firms which acquired valuable concessionary rights from the government of Venezuela in 1956-57. They have apparently located large reserves; while they initially expected either to refine all of their oil in their own USA facilities or to sell it to other USA refiners, they have been forced to revamp their plans in the light of the USA oil-import control program. Only some of their oil can find an outlet in the United States under the quota program; the rest must search for markets abroad. These companies, therefore, constitute a new competitive force in the USA import business as well as in trade abroad.

The emergence of this new competition is also indicative of what appears to be another fundamental change in international crude-oil marketing. For most of the postwar period, it has generally been believed that the richness and prolificness of the oil fields in the Middle East were without parallel. However, reserves in the Lake Maracaibo fields discovered by these firms are large, and recoveries per well run to many thousands of barrels per day. This oil can apparently be marketed over very wide areas of the globe and still yield its owners a remunerative return on their investment.

Russian export flows appear to have increased somewhat recently, and sales to certain areas have been accompanied by sharply reduced prices. When it does not obtain outlets by means of price-shading, Russian oil frequently represents the Soviet Union's participation in a barter arrangement whereby commodities are accepted from the second country in exchange for petroleum. Such barter exchanges can seldom be undertaken by private oil companies and thus represent an advantage which Russian oil enjoys over supplies produced in the free world.

Although Russian oil exports could be halted at any time by Soviet authorities, their flow appears to many observers to be more permanent than transitory. If this is indeed the case, then these shipments could have important implications for company-government relations in certain oil-producing countries as well as for the international oil trade. Russian oil sales to free world markets obviously displace oil produced in the free world. The marketing organizations of oil companies not only lose revenues they would otherwise have obtained, but the governments of countries where oil is produced suffer a competitive loss in their tax revenues. In areas such as the Middle East where the Soviet Union is trying to expand its influence, this loss of government income could well tend to inhibit the Russian drive.

The opportunity for both USA companies new to international oil marketing, and the Soviet Union as well, to distribute their oil abroad has been facilitated by the ample, if not burdensome, supply of tanker tonnage available on the world market. Most of the USA companies with new concessions in Lake Maracaibo owned very little, if any, tanker tonnage when they discovered oil there. However, they have found it relatively easy, in the first place, to charter virtually all of the vessels they require. Second, they have obtained tonnage at low rates or, say, near USMC minus 50%.

In a period when tanker tonnage was already fully or nearly completely utilized, such firms might not have been able to acquire charters immediately; certainly they would have had to accept fixtures at much higher rates. This would have affected op-

(Continued on page 94)

Assembling diesel-electric power units at a well site near Fort Stockton, Texas (photo courtesy General Electric Co. and Great Western Drilling Co.).

Recent developments in drilling equipment

by Lester C. Uren*

A visit to the 1959 centennial oil shows, particularly the heavy exhibits at the International Petroleum Exposition in Tulsa, will reveal a remarkable advance in equipment design since the last previous show in 1953.

Two events scheduled for the year 1959 will afford opportunity for all who are interested in any phase of the petroleum and natural-gas industries to review progress in development of new industry equipment and techniques. These are the International Petroleum Exposition at Tulsa, May 14 to 23, where equipment of the industry will be displayed; and the Fifth World Petroleum Congress in New York, N. Y., May 30 to June 4, where leaders of the industry from many countries will present a program of technical papers reviewing recent progress in industry processes and methods. It seems particularly appropriate that these events should be held in the United States in this, the centennial year commemorating the drilling of the Drake well, which marked the beginning of the modern phase of the world's petroleum industry.

Six years have elapsed since the last Tulsa petroleum exposition; and during that time many new devices have been developed and have found application in today's modern petroleum industry. Much of the industry's previously used equipment has been improved. Two thousand manufacturers will participate in displaying half a billion dollars worth of equipment items, and the exposition promises to be the most complete display of petroleum-industry equipment ever assembled. Though available space does not permit anything like a description of even a small part of the equipment items which will be displayed, it is possible at this time, by reviewing recent industry trends, to forecast the nature of the equipment exhibits which are likely to attract visitors who have come to depend upon attendance at the Tulsa exposition as a means of keeping abreast of new developments in the industry.

Magnitude of the Petroleum Equipment Industry of the United States: A recent survey by the Petroleum Equipment Suppliers' Assn. indicates that, in the year 1957, the petroleum industry spent $1,175,000,000 for drilling and producing equipment and services. This is about 7.3% higher than the comparable figure reported for 1955 and 18% higher than that reported for 1954. Of the 1955 total, it is estimated that about 18% represented services and 82% equipment. Assuming that these percentages also apply to the year 1957, $203,939,224 was spent for services in 1957 and $929,056,470 for equipment and materials.

Recent Trends in Development of Drilling Equipment: One might reasonably expect that 100 years of oil- and gas-well drilling, during which upwards of a million wells have been drilled in the United States alone, would by now have standardized drilling equipment. However, this is not the case, and in some ways progress in the development of new drilling equipment and techniques during the past decade has resulted in more important changes in the drilling art than in any previous similar period. Wells are being drilled to depths never previously attained. Radically different methods of making hole, removing drill cuttings, logging formations, casing wells, and conducting cementing operations have been developed; smaller-diameter holes are drilled; drilling rigs are more readily portable, more quickly assembled, and disassembled; and though the cost of labor and equipment has greatly increased, the cost per foot of hole drilled has increased only moderately.

Deeper Drilling: The 25,000-ft well, for many years talked about as the ultimate in

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Diamond-set core bit used with Christensen rubber-sleeve core barrel.

drilling depth, has at last been attained; and this has been achieved not by any climactic development of new devices or techniques, but rather by the skilled use and perfection of the conventional rotary equipment of earlier days. Careful selection of materials and good engineering design for all parts of the well balanced rig, have made this great achievement possible. We should not assume that many wells will be drilled to this depth, for it is doubtful if 25,000-ft wells will be necessary or economically expedient in many cases; yet it is assuring to know that our modern drilling equipment is capable of reaching to such depths when circumstances demand. Furthermore, it must not be assumed that this marks the depth limit which may be attained with present equipment.

Conventional Rotary Rigs: Pumps—Deeper drilling has required rigs of greater power output, particularly hydraulic horsepower delivered by the circulating pumps. Some slush pumps are rated as high as 2,000 input horsepower, and for some purposes two or more pumps may be compounded to apply higher pressures and handle greater volumes. Large heavy-duty pumps are less readily portable, but this difficulty can be remedied in part by use of aluminum in construction of some of their parts. By use of light metals, a 1,500-hp. slush pump of new design may weigh 60% less than a conventional duplex power pump of equipvalent rating.

Proper design of the down-the-hole equipment seeks to deliver maximum hydraulic power at the lower end of the drill column, and requires careful analysis of pressures, volume of fluid circulated, and flow characteristics of the drilling fluid. This is particularly important in use of jet drilling bits or mud-operated turbines such as are used in operation of turbo drills. A centrifugal pump used as a "supercharger" on the slush-pump suction line gives smoother high-speed operation, particularly in handling gas-cut or aerated drilling fluids.

Power Plant: Diesel engines continue to be the favored source of rig power, though the twin-cylinder steam engine, formerly almost universally used for rotary drilling, is still regarded—for comparative purposes—as the ideal type of power. The less flexible characteristics of the internal-combustion type of engine are compensated by use of modern multi-engine transmission systems, often embodying hydraulic couplings or torque drives which assure smoothness in transmission under all conditions of speed and power output. Two-, three- or four-engine transmission systems are employed, depending upon the depth of the well and power requirements. Chains or V-belts connect sprockets or sheaves keyed to the several shafts of the transmission system. For drilling to depths of 20,000 ft, a drilling barge is equipped with three 520-hp diesel engines to drive the drawworks and pumps, while the rotary table is equipped with a separate 330-hp engine. Thus, a rotary rig designed for deep drilling may be equipped with 2,000 mechanical horsepower or more, but it will seldom all be used at the same time.

Offshore drilling has encouraged application of barge-mounted diesel-electric power plants, in which diesel engines are used to operate dc generators, furnishing power to dc motors which, in turn, drive the drawworks, pumps, and rotary table. Direct-current motors have characteristics which provide a wide range of speed and torque, and are thus well adapted to meet the varying requirements of rotary drilling—rivaling steam equipment in flexibility. A diesel-electric rig designed by the General Electric Co., drilled a 23,000-ft well in 364 days. It handles 600,000 lb net hook load, and successfully set 15,868 ft of $9^{5}/_{8}$-in. casing.

Drawworks: The modern drawworks is a precision-built mechanism in which every component is designed for maximum wear and security in operation under heavy loads. Newer models provide many refinements not found in drawworks of a decade ago. A purchaser should look for rigid-frame construction; a long large-diameter grooved cast-steel hoisting drum; wide well-balanced press-forged water-cooled brake flanges of forged alloy steel, with powerful hand-lever controls and auxiliary hydromatic or dynamatic brakes. Mechanical brakes are of the multiple-leverage type, with a safety equalizer designed to assure uniform tension on each of the two brakes and to permit one of the two to function in case the other fails. Replaceable molded brake blocks are used. Sprockets are of manganese or electric cast steel, precision-cut by machine methods, and have flame-hardened teeth. Chain belts are constructed of alloy steel, preferably of "roller" type. Shafts are made of chrome-nickel steel, forged and heat-treated. Roller bearings, mounted in alloy-steel-hardened raceways, are used for all shafts. Friction clutches of manganese steel may be hydraulically, pneumatically or manually controlled. Compressed-air drum-type clutches are now widely used. No small part of the superior performance and greater strength of the modern drawworks is due to the use of materials especially selected for the heavy-duty imposed.

Flood or "cascade" lubrication is provided by a pump which delivers a continuous supply of oil to all chains and sprockets. Alemite lubrication is used for bearings and other parts not reached by flood lubrication. Control mechanisms are conveniently arranged at the driller's position at the side of the drawworks. In this connection, there has been a notable advance in the development of automatic control devices, permitting a delicacy of control not formerly possible.

Rotary Tables: The relative merits of chain-driven or shaft-driven rotary tables are still discussed. Though the latter is more expensive because of the necessary additional gearing, bearings, and supports, the shaft drive has important advantages—particularly in reducing hazards of chain breakage, noise, and freedom from obstructions about the rotary table, and this is important in handling drill pipe.

Important considerations in purchasing a rotary machine are the use of wear and shock-resisting metals, spiral gears, and anti-friction bearings. Spiral gears are preferred to bevel gears because they provide better wear resistance, smoother and quieter operation, with a minimum of impact stress and vibration. Roller and ball bearings and their hardened-steel raceways must be capable of supporting long, heavy strings of drill pipe which, in a deep well, may aggregate several hundred tons. The main bearings and gears are flood-lubricated, rotation of the table maintaining circulation.

A growing preference is noted for the use of automatic power slips, actuated by compressed air, to aid in coupling and uncoupling drill-pipe tool joints. A radical device designed to replace some functions of the conventional rotary table is the power swivel, still in an early stage of development. In this device, power is applied to the swivel to rotate the drill column instead of at the rotary table. Deep drilling has emphasized the advantages of using a separate engine or motor for driving the rotary table. This can conveniently be placed below the derrick floor.

Drill-Pipe and Tool-Joint Improvements: Improved heat-treatment methods and use of alloying metals have produced stronger steels for manufacture of drill pipe and tool joints. API grade "E" steel is capable of developing a minimum tensile strength of 100,000 psi and a minimum yield strength of 75,000 psi. For deep drilling requiring metal of greater strength, a grade of steel developing a minimum yield strength of 105,000 psi is also available from some manufacturers. For 20,000-ft drilling, steel having a tensile strength as high as 170,000 psi is produced by a process involving quenching and tempering. For manufacture of drill pipe, the steel must not only have the essential yield and ultimate tensile strength, but must possess sufficient ductility to withstand an elongation of 18% in a 2-in. test specimen.

For manufacture of tool joints, alloy steels are commonly used—produced by addition of manganese, nickel, chromium, vanadium, tungsten, molybdenum, or cobalt to the essential iron and carbon. Chromium, molybdenum, and nickel-alloy steels are widely used where superior qualities are required. Older types of tool joints, in which the parts

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are connected to the ends of the drill pipe by threaded joints, have been largely replaced by types in which the tool joints are welded to the drill pipe or are formed integrally with the upset drill-pipe ends during manufacture. A widely used type is designed to be "flash-welded" directly to plain-end upset drill pipe. Flash-welding involves preheating the ends of the pipe and tool joints and then joining them by electric-resistance welding as they are pressed together with upsetting force. The welded zone is then heat-treated to relieve stress and both inside and outside surfaces are machine-finished.

Improper makeup of tool joints is one of the principal causes of failure in service; and, to assure application of proper torque in making-up joints, tong torque gauges are now available. Automatic power slips may also be equipped with torque gauges.

Rotary-Drilling Bit Improvements: Notable improvements have been made during recent years in cone and roller (cross) bits for rotary drilling. These include better selection of metals and heat treatment, better design of bearings and cutting teeth, and improved methods of hard-facing tooth faces and cutting edges. Jet-type bits have larger ports, placed to deliver a large volume of high-pressure drilling fluid directly against the bottom of the hole, thus aiding materially in the excavation process and keeping drill cuttings off bottom. A type of cone bit, in which cylindrical tungsten-carbide inserts are used instead of cutting teeth, gives especially high footage. One such bit drilled 7,144 ft of hole in an air-drilling operation in a Pennsylvania well in 160 hours and 45 min.

Diamond-set rotary bits are becoming increasingly popular, particularly for core drilling. A new diamond-set rubber-sleeve core barrel delivers an undisturbed core, exactly as it was in the formation, uncontaminated by drilling fluid.

Portability of Drilling Equipment: The average depth to which oil and gas wells have been drilled during recent years is approximately 4,500 ft, though in the newer fields recently exploited many thousands of wells have been drilled to depths of from 5,000 ft to 10,000 ft. Consequently, some manufacturers of drilling equipment have focused on development of rigs which will be efficient in drilling wells of moderate depth. Here, considerations of easy portability and rapid assembling and disassembling in movement of rigs from one location to another have seemed important. Unitization of drilling equipment—with each important element of the rig permanently mounted with its closely associated equipment on its own steel skids, tractors, or wheeled vehicles—has made this possible.

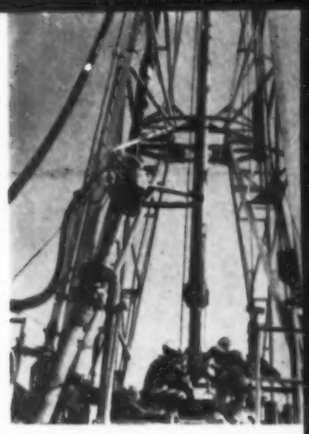
For example, a modern rotary rig with folding derrick, capable of drilling to depths of 8,000 ft or more, may be moved in six unitized packages, none of which exceeds highway weight limitations, and assembled on a new site in but a few hours. One rig of this type drilled over 32 miles of hole in 1957. A drilling contractor in the El Dorado, Kans. area, using a light portable rotary rig, has drilled 297 wells, averaging a little more than 3,000 ft per well, or a total footage of 893,258 ft of hole, in 82 months of almost continuous operation. This averages more than 3½ wells per month for a period of seven years. Only five 4½-in. strings of drill pipe have been used, and rig part replacements have occasioned only moderate cost and time loss.

Slim-Hole Drilling: Experience has demonstrated marked economy in drilling wells of relatively small diameter in preference to wells of conventional size. In many areas, producing wells may be economically drilled and cased with only two strings of casing, with a finishing diameter capable of receiving pipe only 4½ in. in diameter. Inasmuch as casing represents a large percentage of the total cost of a well—perhaps 30% or more—important economies are possible by using lighter-weight smaller-diameter casing. Of course, there are limits to which reduction in diameter can be carried without adversely influencing productivity of wells and well-maintenance operations.

Combined with permanent completion procedures, slim-hole drilling costs for 7,100-ft wells in West Texas have been reduced about 36% in comparison with costs for drilling wells of conventional size. Here wells are drilled with 6⅛-in. bits to finishing depth, and parallel strings of 2½-in. and 1-in. tubing are cemented in the hole for production by the free-piston method. Total completed cost for one such well is estimated at $52,835, or only about $7.50 per foot of depth. This represents a saving of nearly $30,000 per well in comparison with conventional completions in the same area.

Marine Drilling Developments: Efforts to develop new oil and gas pools in the offshore areas of the Gulf of Mexico, the Pacific Coast of southern California, the Persian Gulf, the Gulf of Paria, and elsewhere have resulted in revolutionary new types of equipment, particularly in the use of platforms and various types of barges which will provide foundations for drilling rigs under open-sea conditions in water 100-ft or more in depth. Early efforts to provide foundations for drilling rigs under such conditions involved construction of fixed platforms supported by steel columns driven into the ocean floor. However, such platforms are expensive to construct and have definite depth limitations and low salvage value.

New types of submersible barges with the drilling rigs permanently mounted on their decks have also been developed. These barges can be towed to the offshore location, and submersible elements then lowered to rest on bottom. Floating barges or small ships (such as converted LST's) carrying power-development equipment, drilling fluid, casing, drill pipe, etc., are sometimes used as "tenders" in support of drilling operations from platforms or submersible barges. Mobile barges equipped with three or more steel legs which can be extended downward to the ocean floor have proved advantageous in water as deep as 100 ft. For deeper waters along the Pacific Coast of southern California, anchored floating barges have been used to drill wells through special types of well-head equipment established on the ocean floor. One of these is capable of operating in water 400 ft deep. Here, too, drilling has been conducted from piers extending out from shore into water 60 ft deep, and from offshore man-made islands.



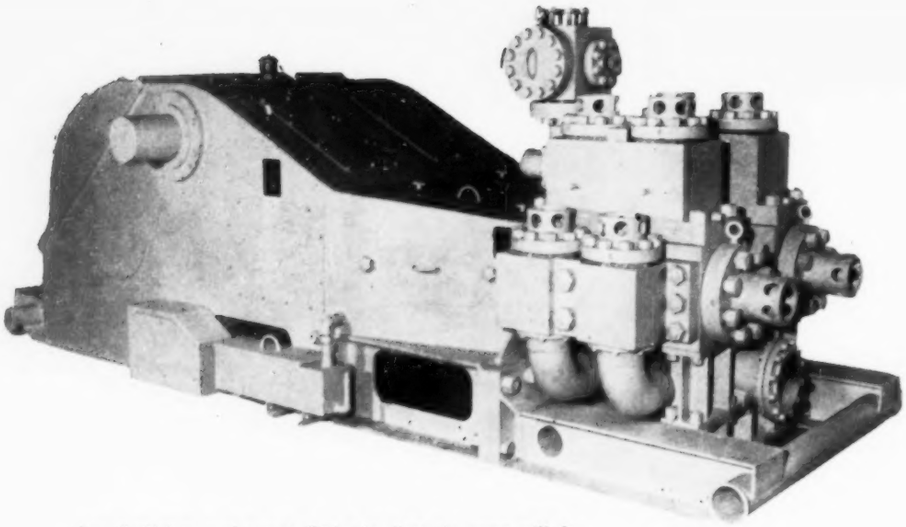
Turbodrill and 17½-in. cone bit suspended in derrick, Moran Drilling Co. rig, Herscher Dome, Illinois, where wells have been drilled through hard formations into a natural-gas storage reservoir (courtesy of Dresser Industries Inc., Turbodrill Division).

The high cost of marine foundations would make drilling costs prohibitive were it not for directional drilling, which makes it possible to drill several deflected wells from one surface location. A platform 52-ft by 157-ft, 1½ miles off the west coast of Trinidad in the Gulf of Paria, in water 68 ft deep, will be used for drilling 36 directionally-drilled wells.

The many promising offshore areas where new, prolific oil and gas pools may be found gives assurance that marine drilling operations will continue for many years. No standard type of marine foundation structure has yet been devised, and further development and testing of existing and possibly new types of rig foundations may be expected to continue.

Aside from the provision of rig foundations, marine operations have also required novel types of under-water pipelines and production and control facilities, and unusual methods of communication and transport of supplies and personnel. Rough seas attending offshore storm conditions present added hazards in maintenance of equipment and protection of personnel. Maritime rules governing security of vessels traversing coastal waterways impose regulations quite foreign to oil-industry operations on land.

Drilling-Fluid Technology: Satisfactory progress in rotary drilling by conventional methods requires close attention to the properties of the drilling fluid employed. Upwards of a hundred million dollars is expended annually in providing drilling fluid for the approximately 3,000 rotary rigs in use in the United States; and, because of its high cost and importance in assuring satisfactory completion of wells, it is worthy of careful analysis and control. In every important rotary-drilling operation, a drilling-fluid specialist should be available to the drilling crew for consultation and advice



New Bethlehem mud pump: With 6-in. liner the pump will deliver 325 gpm and 4,570 psi with maximum input horsepower of 1,020 at 50 rpm. At 90 rpm fluid volume rises to 585 gpm and maximum input horsepower to 1,835.

and for necessary tests when critical situations arise.

The essential properties of the drilling fluid are controlled by careful selection and preparation of the clay used and by various materials which may be added to the clay-water mixture. In the routine of drilling, the drilling fluid may become contaminated by substances which tend to destroy or alter its essential properties, and it then becomes necessary to add counteracting materials to restore these properties. Much of the progress in drilling-fluid technology during recent years has been in the direction of developing chemical reagents and various inert materials which can be added to mud fluids to control their physical properties and to render them better able to achieve their intended functions.

Oil-base drilling fluids are widely used in deep-drilling operations and as completion fluids, particularly in drilling into and through low-pressure reservoirs where, if water-base muds are used, deposited clay on the walls of the well or in the pores of the wall rocks, might subsequently restrict production. Oil-base muds are also helpful in drilling through heaving shales and salt-bearing formations where contact with water would be detrimental. Oil-base muds are not sensitive to anhydrite, gypsum, or cement contamination. They also have high lubricating value and reduce drill-pipe torque and power consumption.

Many of the advantages of both water-base and oil-base drilling fluids are shared by emulsion muds, which have recently found widespread use. They may be either of two types: (1) oil-in-water emulsion; or (2) water-in-oil emulsion. The oil-in-water type is considered preferable in most situations. It is easily prepared by adding from 15% to 40% of crude oil or diesel oil to any water-base mud, together with a suitable emulsifying agent, and perhaps a little caustic soda to develop suitable alkalinity. Organic colloids, or salts of fatty acids, lignitic compounds, tannins, etc., may be used as emulsifiers. Any of the reagents and additives used in conventional water-base fluids may be added to control the essential properties. Emulsion muds permit little filter loss to the formation and have good lubricating properties. They are less sensitive to contaminants than water-base muds, and they are less expensive and present less fire hazard than oil-base muds.

New Drilling Techniques: Drilling by the conventional rotary methods has certain disadvantages which are inherent in the type of equipment employed, and producers and manufacturers have been testing radically new ideas which, if successful, may revolutionalize drilling equipment and practices of the future. Among these, several different drilling methods are worthy of mention. Air- or gas-drilling, in which compressed air or natural gas is substituted for mud fluid as the circulating medium used for removal of drill cuttings from the well, has already been tested and found to be advantageous under certain conditions. The turbo drill, in which the drilling bit, supported on the lower end of a stationary or slowly rotating drill column, is rotated by a turbine driven by the circulating fluid. This device has been successfully used in the Russian oil fields, and is currently being redesigned and improved by an American tool manufacturer. A somewhat similar device is one in which the bit is rotated by an electric motor supported on the lower end of the drill column. The percussion rotary drill combines both rotary motion and a percussion or vibratory action on the drilling bit. Vibration developed by sonic forces may be used to actuate a drilling tool. It has also been suggested that rock may be disintegrated by explosives in the form of shaped charges, directed downward against the bottom of a well; or fused by an oxyacetylene flame or electric arc. Some of these methods appear to offer definite promise.

Air or Gas Drilling: Use of clay-laden water as a fluid for removal of drill cuttings in rotary drilling involves expenditure of considerable power and tends to seal the pores of the strata exposed in the wall of the well, so that admission of oil and gas through the subsequent period of production may be somewhat impeded. Substitution of compressed air or natural gas in sufficient volume and pressure for the usual mud-laden fluid readily sweeps the drill cuttings from the drilling zone to the surface through the annulus between the drill pipe and the wall of the well. This method offers definite advantages, including greater drilling speed and longer bit life; the possibility of sealing the producing formation with mud is avoided; cores can be taken without mud contamination; and problems incidental to lost circulation can be avoided. However, there are certain disadvantages: No provision can be made for consolidating and sealing the walls of the well in soft, caving formations, and it is difficult to control high formational fluid pressures when they are encountered. If the formations penetrated yield water to the well, the drill cuttings become wet and sticky, and are likely to cling to the walls of the well and the drill pipe and clog the annular space. If natural gas is used as the circulating medium, a considerable fire hazard is presented about the well head and in the surface facilities.

Portable air or gas compressors are brought to the well site and substituted for the conventional slush pumps when this method of drilling is used. An ascending velocity in the annular space of from 2,000 ft to 3,000 ft per min is required to effectively remove drill cuttings. Three 750-cu-ft-per-min capacity trailer-mounted V-type 265 psig-rated compressors will ordinarily supply sufficient gas for drilling to depths of 5,000 ft.

In drilling by this method in hard-rock areas of eastern Oklahoma and northwest Kansas, a saving of 22% was realized by using compressed air or gas rather than mud-laden fluid. The average penetration rate was increased by 630%. Improvements in equipment and drilling techniques should yield even better results. Improvements may also be realized in power conservation by reducing friction losses and by proper choice of size and hole and drill pipe to maintain the most efficient size of annular space. Reverse circulation gives improved performance in some cases. Use of foaming agents and wall-sealing compounds may be successful in reducing access of water to the hole.

The Turbo Drill: A type of turbo drill has been used in drilling wells in the oil fields of the USSR for many years. Recently, it was stated that 80% of the drilling in Russian fields is being done by turbo drills. In 1933, the writer had opportunity to observe the performance of the Russian version of the turbo drill of that time, but great difficulty was being experienced in excessive wear of the speed-reduction gearing then used, by gritty drilling fluid. Later, experiments were made by an American oil company with the Russian turbo drill, but the models then available were found to be unsatisfactory. More recently, improvements have been made by the Russians, and also in a French version. In 1957, Dresser Industries Inc. acquired current Russian and French models of the turbo drill and began

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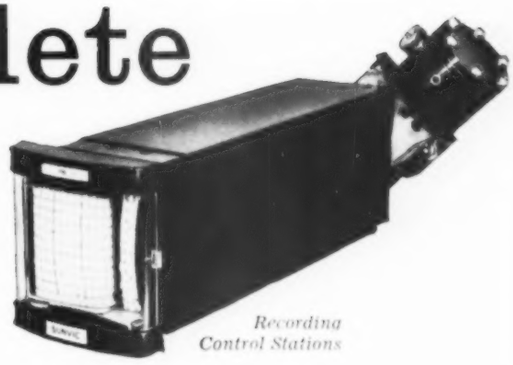
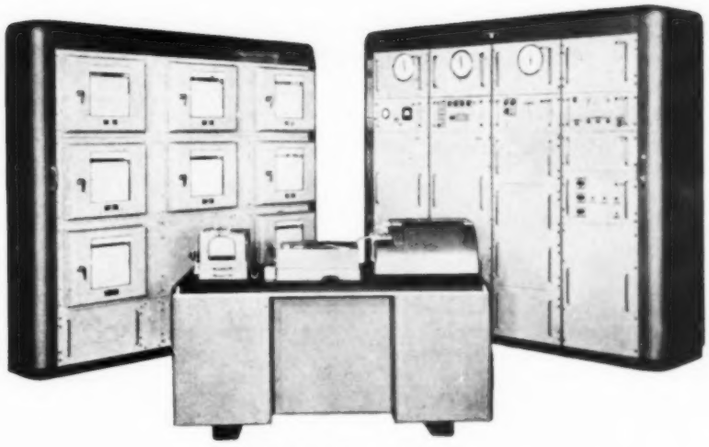
High Speed Recorders

Relays



Recording Control Stations



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Top records set by Halliburton Oil Well Cementing Co. in 1958 were cementing liner at Phillips Petroleum Co.'s 25,300-ft University EE-1 test in Pecos County, Texas—first cementing job below 25,000-ft—and cementing long string at Howell & Howell's No. 1 Anadarko Basin in western Oklahoma—longest cement column ever placed. New cementing materials and more powerful pumps made the jobs possible. Halliburton researchers find that heat, not depth, is a major problem in cementing ultradeep wells.

a serious effort to test and adapt this type of drill to American conditions. An almost completely redesigned turbo drill has resulted, which is apparently successful under favorable conditions.

Drilling shallow wells for gas injection on the Herscher Dome in Illinois, Dresser turbo drills have completed wells in one-third of the time necessary for drilling with conventional rotary rigs. Twistoffs of the drill column have been practically eliminated. Drilling to depths of 12,000 ft to 13,000 ft through hard formations in the Lacq gas field in southern France, the drilling time with turbo drills has been about 6 to 7 months in comparison with 12 months for conventional rotary rigs. Diamond bits with turbo drills are capable of making 300 ft of hole in 24 hours under conditions where the conventional rotary makes only 60 ft.

One of the principal problems in development of a satisfactory turbo drill has been that of designing a drilling bit which will stand up under the high rotational speed (600 rpm), especially with the smaller sizes of bits.

Casing: No small part of the success of recent deep-drilling operations and economy in drilling cost has been due to the development of casing which has made possible improvements in design of casing installations. Notable improvement in the quality of casing steels and joint design have resulted from cooperation between the tube manufacturers, oil companies, and contract drillers—particularly by the Tubular Goods Committee of the American Petroleum Institute. By proper selection of quality, size, and weight of casing and type of joint, it is now possible to design a long, heavy, graduated string of casing with assurance of security against all types of failure, and at minimum cost.

An example is found in the design and successful placement of a 22,919-ft graduated string of casing recently used in Phillips Petroleum Co.'s No. 1 EE University well in West Texas, presently the world's deepest well. The accompanying table lists the nine different components of this record-breaking column of casing:

Special types of threaded joints which avoid use of couplings are especially advantageous in minimizing wall friction in placing long strings of casing in deep wells. One of these, known as "Extremeline" casing, utilizes modified acme threads on upset ends, without collars. This casing is watertight; has a uniform interior diameter, and a stream-lined exterior without sharp shoulders. A joint efficiency of 100% is attained, and there are 50% fewer threads than in ordinary collared joints.

Cementing Equipment and Cement Additives: Techniques for cementing casing in deep wells are becoming more complex, and have necessitated development of new equipment and use of new materials. In cementing long strings of casing, suitable floating devices must be employed to relieve the surface equipment of excessive stress. Weight indicators must be used to measure the stresses developed. Cement-mixing facilities of large capacity and high-duty pumps capable of handling large volumes of cement slurry at high pressure must be provided.

For example, in cementing the 22,919-ft string of casing mentioned in the preceding section, four duplex pumps, working against pressures as high as 1,900 psi, placed 951 bbl of cement slurry around the lowermost 18,819 ft of the casing column in 1 hour, 43 min. A total of 3 hours, 37 min was required to mix 1,247 sacks of cement and 43,885 lb of cement additives with 760-bbl of water and pump the resulting 5,183 cu ft of slurrified cement into place around the casing. Cement slurry was displaced from the casing at an average rate of 9.2 bbl per min.

A variety of additives is employed to control the setting time and flow properties of slurrified cement used in cementing casing in wells. Gilsonite may be added to increase volume and reduce density of cement slurries without appreciably influencing the setting characteristics. Slurries weighing only 10 or 11 lb per cu ft are compounded by this means. Each 100 lb of gilsonite mixed with 4 gal of water adds 2 cu ft to the bulk volume of the cement slurry. Finely ground pozzolanic materials are also added to portland-cement slurries to produce lightweight less-permeable mixtures which are resistant to sulfate and salt-water corrosion. For use in formations developing high temperatures, pozzolanic materials are also added to hydraulic lime, with other additives, to control setting time and produce a slurry of maximum pumpability and high early strength for use in deep wells.

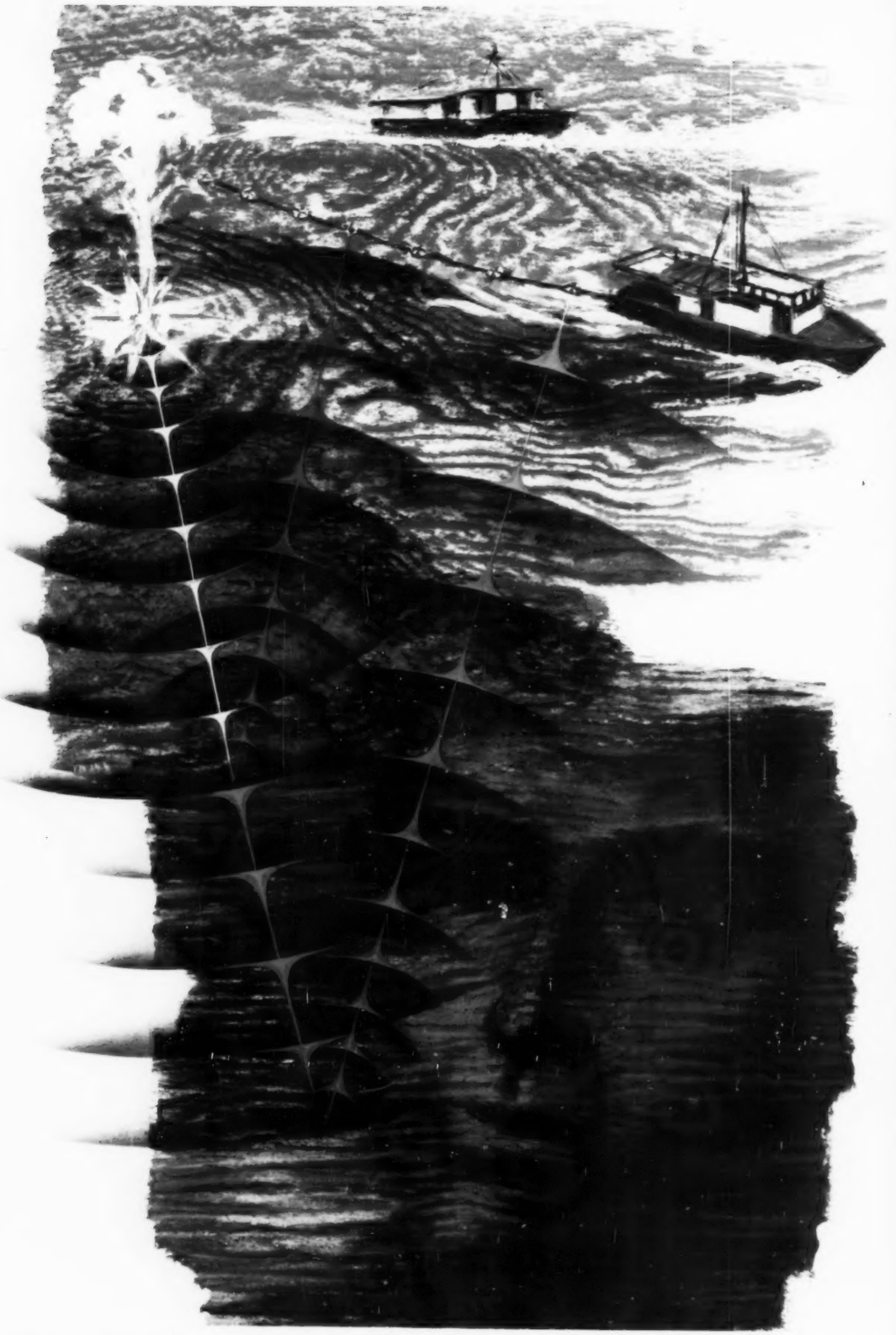
Various chemical additives are also used for accelerating or retarding the setting time of cement slurries; for improving their pumping properties; and for neutralizing the effects of drilling-fluid additives with which the cement must come into contact. Cement ground to a fineness which requires a minimum of mixing water produces a cement slurry of unusually high density, yet maintains pumpability and strength at high temperatures.

Well-Logging Techniques: Progress continues to be made in quantitative interpretation of electrical logs and nuclear or radioactivity logs, involving improvement in equipment and instrumentation used for this purpose. The self-potential and resistivity curves of the electrical log and the gamma-ray and neutron curves of the radioactivity log have been found to possess definite quantitative significance in estimation of oil and water content of strata and their porosity and permeability. Further refinements are afforded by various micrologging and focusing devices. Induction logging provides an entirely different approach to the measurement of formation resistivity, and requires use of a different type of logging instrument. New and as yet less well developed logging devices measure variations in subsurface and well conditions which are important in many ways. Logs based on measurement of density and accoustical properties of formations offer promise. The "dipmeter" applies variations in self-potential profiles to determine the dip of strata penetrated by a well. All of these logging devices have their own peculiar type of equipment and instrumentation, and are undergoing continual improvement with increasing dependability in service. In

Components of World's Longest String, 22,919 Ft

Casing-Size Outside Diameter (Inches)	Length (Feet)	Grade of Steel (API)	Weight (Lb Per Ft)	Type of Joint
$7^{5}/_{8}$	1,615	P-110	39.0	"Extremeline"
$7^{5}/_{8}$	1,516	P-110	33.9	"Extremeline"
$7^{5}/_{8}$	7,146	P-110	29.7	"Extremeline"
	10,277			
7 in.	2,785	P-110	26.0	Buttress thread
7 in.	3,482	P-110	29.0	Buttress thread
7 in.	2,485	P-110	32.0	Triple Seal
7 in.	2,635	P-110	35.0	Long threads and Couplings
7 in.	438	S-95	38.0	Short threads and Couplings
7 in.	817	P-110	38.0	Long threads and Couplings
	12,642			

IN CANADA: G. DIKKERS OF CANADA LIMITED, SCARBOROUGH, ONTARIO



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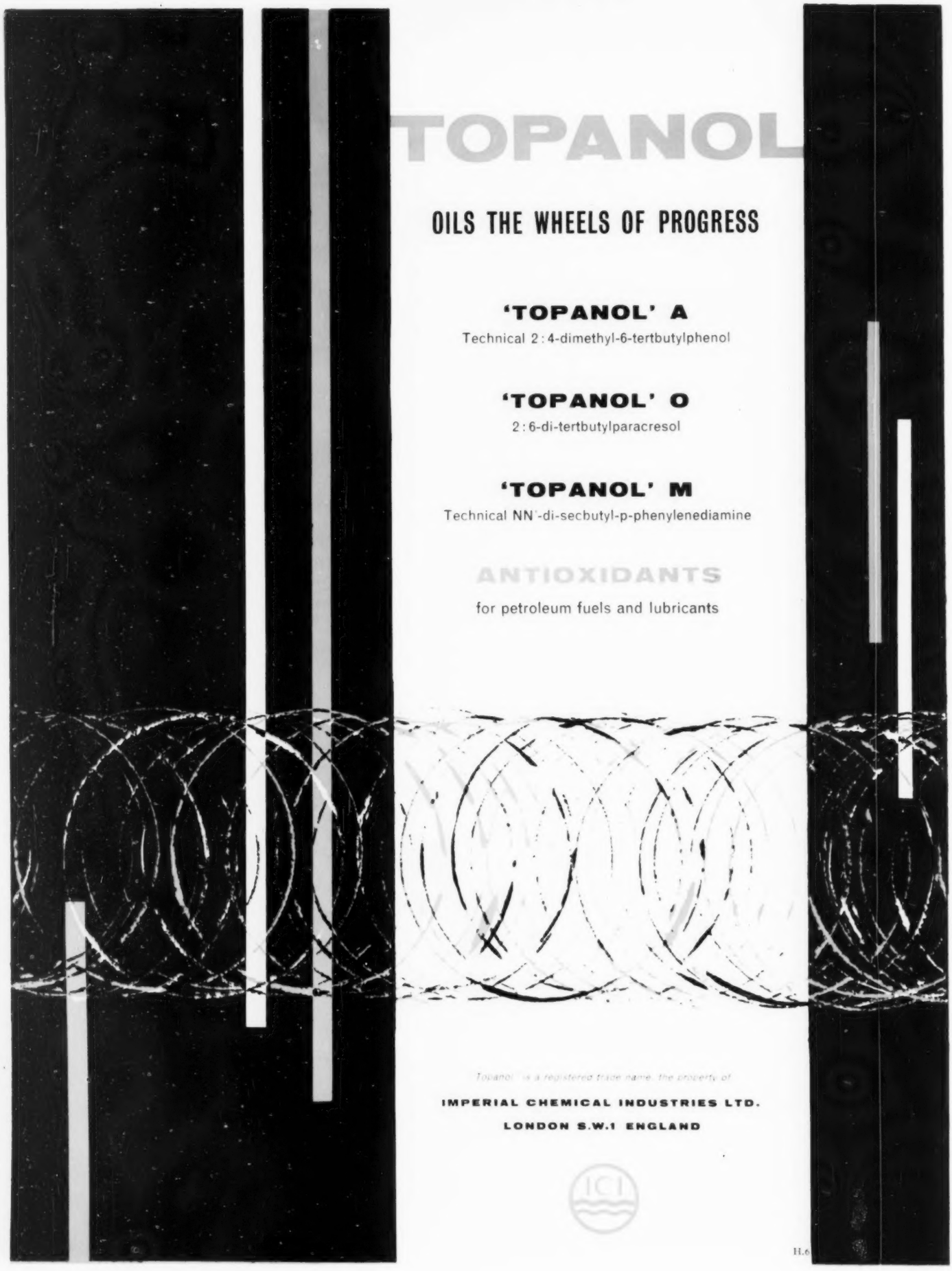

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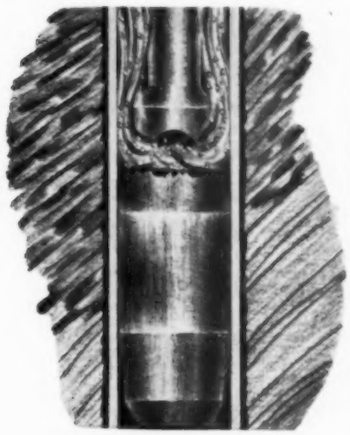

The McCullough Bridge Plug drills out easily. Average time usually runs from one to two hours. Best results have been obtained by using a regular rock bit with about one point of weight, rotating at high R.P.M. Cable tools should not be used for drilling out.

Unusual Application of McCullough Plug Shuts Off Bottom Hole Water

A production packer with 2.688" I.D. mandrel was set at 5600'. Well had been squeezed through the packer and was producing from perforations just above.

The squeeze job later failed and the well started making water through the packer mandrel. A 1¾" O.D. McCullough Bridge Plug was set in the mandrel and cement was dumped on top of the plug with a 1¾" O.D. McCullough Dump Bailer. Water shut-off was successful and the well was put back on production.

Jobs like this demonstrate the versatility of McCullough's line of Bridge Plugs. Wherever a plugging problem exists, there is a McCullough Plug to solve it.

Solid Aluminum Bridge Plug Assures Positive Seal

Set in 1951, a McCullough 4½" O.D. Bridge Plug Was Re-tested in 1956 to 5500 lbs. —Without Leakage

Seldom, in an oil well, is it possible to determine the reliability of a service performed five years previously.

This well, drilled in 1951, was cased through the pay zone with 5½" O.D. 17 lb. cemented casing. A 4½" O.D. McCullough all-metal Bridge Plug was set below the pay and the formation was squeezed for water shut-off. No cement was dumped on top of the plug. The pay zone was perforated and the well put on production.

Late in 1956 water broke into the well. The operator ran in with a squeeze tool and tested the McCullough Plug at 5500 lbs. After five years it still provided a leak-proof seal.

McCullough Bridge Plugs have no hardened parts—no moving parts. They are made of drillable aluminum metal. Slips, reins, rubber packers, etc. have all been eliminated. Ideal for either permanent or temporary plugging operations. Available in 37 sizes to plug in tubing, drill pipe, casing and in open hole in hard formations.

Another 4½" O.D. McCullough Bridge Plug was set just above the perforations at 8150'. Again, no cement was dumped on the plug. This zone was also squeezed with 5500 lbs. pressure. The plug was secure and leak-proof.

It required 2½ hours to run and set the plug which was drilled out three days later in 1½ hours with a rotary rock bit.

McCullough Bridge Plugs are favorites with operators and squeeze tool men. They will withstand as much hydrostatic pressure as the casing and will last as long as the casing.

The jobs described above are certified to be true field reports of services rendered.

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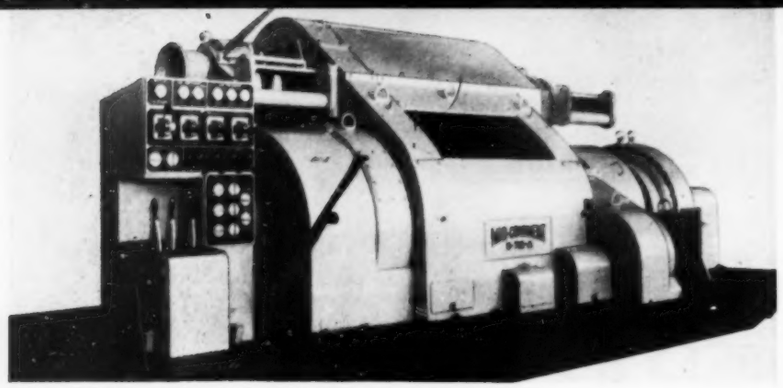


New Mid-Continent drawworks for medium-depth drilling rated at 700-hp to 1,200-hp net: The unit is less than 10 ft wide, weighs about 43,750 lb, and is skid-mounted for easy highway movement.

This is the latest version of Dowell's Allison-powered pump truck used in oil-well acidizing and fracturing operations. The new lower silhouette was achieved by redesigning the housing around the powerful aircraft engine. This 1,500-hp pumper is remote-controlled, and delivers up to 20 bbl of fluid per minute.

each case, they are offered to the industry by service organizations with personnel especially trained in their use. Engineers especially trained in log interpretation are employed by most of the larger oil companies, and personnel in the employ of the service organizations will also assist.

Well-Completion Practices: During recent years, much attention has been given to techniques employed in the completion of wells which will improve subsequent production performance or which will reduce production and development costs.

Permanent-Type Completions: For use in some of the limestone and well consolidated sand-producing areas of the Mid Continent region, so-called "permanent type" completions have been found particularly advantageous. In this method, the well is equipped with casing, tubing, and head connections before it is brought into production. With the prospect that these facilities will never be disturbed during the subsequent life of the well, the casing is initially cemented in the well, and a packer is installed in the annulus between the casing and the open-end tubing. Control facilities are provided at the well head. The casing and surrounding cement are then gun-perforated with a small type of gun perforator which can be lowered through the tubing. The well may then be brought in under full control, and production run into surface tankage previously provided.

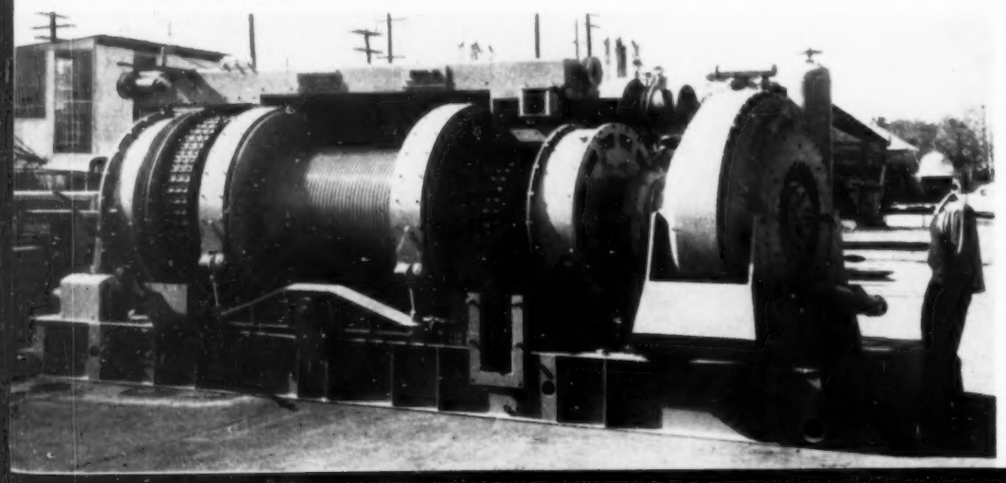
The wells may be equipped for production by either natural flow, gas-lift, plunger-lift, or mechanical pumping. Subsequent clean-out and well-maintenance operations are conducted by circulation methods and use of specially designed small tools which are run through the tubing without disturbing the surface facilities. It is believed the permanent-completion technique would not be advantageous under all conditions.

Shaped-Charge Gun Perforators: Shaped-charge gun perforators have partly replaced the earlier bullet-type gun perforators, and progress has been made during recent years in improved design of the shaped charges and their carriers and methods of firing. New forms of shaped charges are designed to secure better penetration and avoidance of "carrot-shaped" metallic residues in the holes formed in the casing and surrounding cement. Shaped charges of large size are also to form cavities in the wall of the well and fracture hard formations in the path of the drill.

Hydraulic Fracturing: Probably the most important development in well-completion techniques during recent years is what is called "hydraulic fracturing." Many thousands of wells, both new and old, have been subjected to this process, generally with favorable results. The method involves application of high liquid pressure to the reservoir rock or a segment of it, with the purpose of forming crevices extending outward from the wall of the well which will permit oil and gas to flow more readily through the reservoir rock into the well. High-pressure pumps are used to create the hydraulic pressure, and the fluid used is either water or some type of oil in which fine sand grains are suspended. A considerable volume of fluid is forced into the reservoir rock in forming the fractures. The sand is used to prevent the fractures from closing after they have been formed. Hydraulic fracturing is generally done by a service organization with trained personnel who brings the materials and its own specialized pumping and sand-blending equipment to the well.

Multiple-Zone Completions: It is now common practice, in some fields, to case and tube wells so that they may produce from two or more producing horizons simultaneously. Triple and even quadruple strings of tubing have lately been successfully installed in individual wells, each serving a separate producing interval. Production may be by natural flow, gas-lift, plunger-lift, or mechanical pumping. Packers and other special equipment have been devised to facilitate introduction of separate strings of tubing to each producing zone, and to keep the production of each zone separate from that of the others. END

Heavy-duty drawworks with housing removed, showing grooved hoisting drum, chain drives, clutches, and mechanical and "hydromatic" brake system (courtesy of Ideco Division, Dresser Industries Inc.).



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—Eugene Holman, Chairman of the Board, Standard Oil Company (New Jersey)

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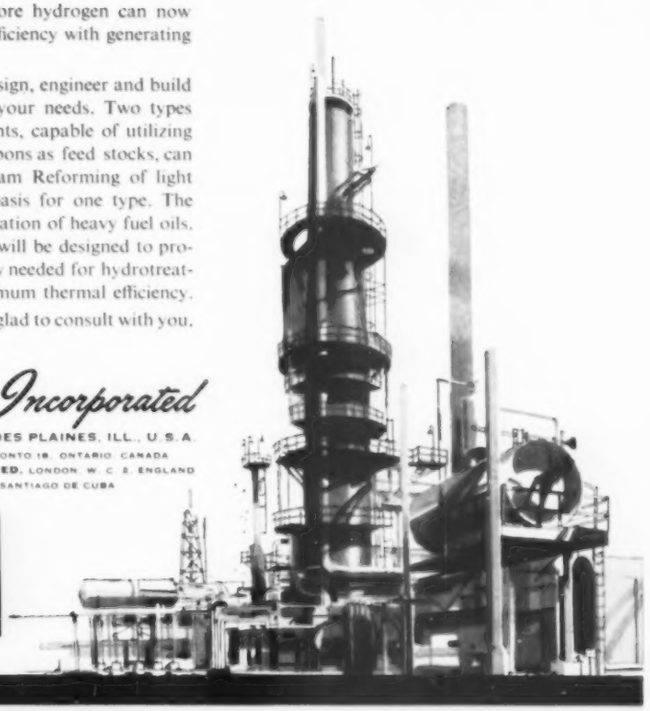

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Interior of Cameron Iron Works Leeds plant.

Demonstration at Leeds plant of Cameron Iron Works Ltd. of a 2,500 psi blowout which was shut in speedily by a 7-in. 10,000-psi working-pressure Cameron type "F" blowout preventer. Visitors were also able to test for themselves how easily the type "F" valve can be closed against very high pressure.

General view of Cameron Iron Works Leeds plant.

Cameron expands manufacturing facilities at Leeds plant

CAMERON Iron Works Ltd. recently invited the European editor of *World Petroleum* to visit its Leeds, England, plant to observe the new tooling installed for the manufacture of the company's new type "F" blowout preventers and valves.

To visit the plant is to be impressed speedily with its level of activity and the high standard of plant and office design in all directions. No plant of its size can have a better range of the world's best machine tools, and foundation preparations were seen for adding to the facilities available for making Cameron well-pressure controls to meet exacting specifications. Workers were under conditions in all respects that many would envy, with ample room for each man and lighting of an exceptionally high standard. It was clear, too, that particular consideration had been given to cooking and canteen facilities, washing arrangements, and similar.

The British company was formed in 1954, and the subsequent increase in business compelled the establishment of a modern factory which was occupied late in 1957. This company forms the main manufacturing entity of the Cameron International Division which was created to handle Cameron's expanding business outside the domestic USA.

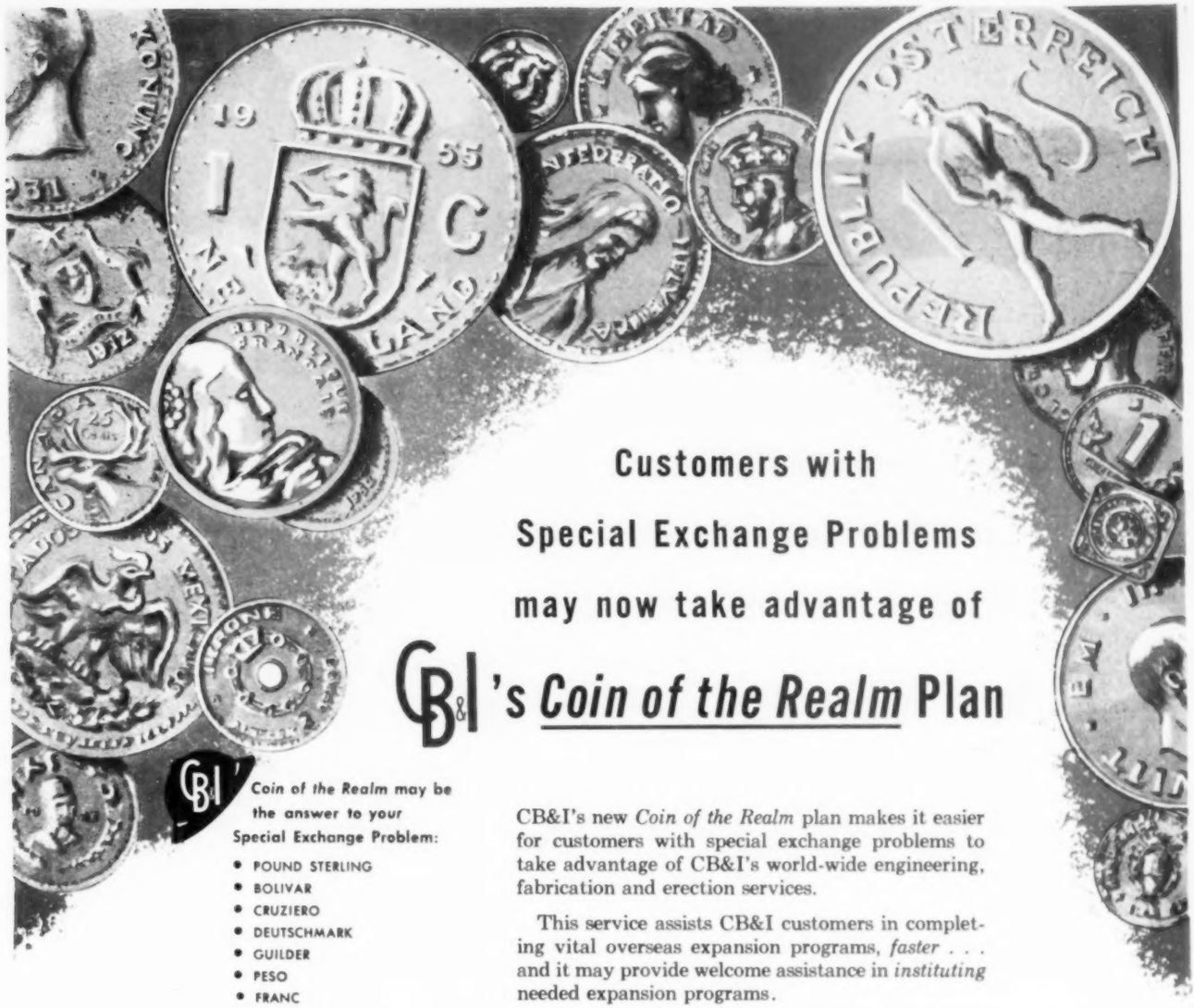
Nearly all of the full range of Cameron equipment is now being made or will be made in the UK, and plans are in hand for extension which will add a 60-ft by 350-ft bay to the existing plant area of 65,000 sq ft. This additional space will provide room to accommodate the equipment to speed up production of new Houston-designed items and to give more space for allied services.

It was clear from the visit that particular attention is paid to inspection of equipment and parts, which must be fully interchangeable with those supplied by Cameron in Houston. A rigid procedure is followed to insure that quality is maintained at the highest level, and all equipment is tested at least to API standards. Test facilities are neat and up-to-date, and test pressures are available up to 35,000 psi.

The works is now being equipped and tooled up to begin manufacture early this year of the recently introduced type "F" blowout preventer and the type "F" valve. Designed to meet the demand for extra-high-pressure control equipment in the 10,000 to 15,000 psi working pressure range, and tested exhaustively in the field, the former was seen to have an entirely new system of operation, and only the force necessary to overcome friction was required for ram movement. It was demonstrated that the use of a new simplified hydraulic operator in the type "F" blowout preventer insures rapid movement at the initial stages of movement and a high mechanical advantage at the point of closure. Other points demonstrated were the ease of closure in emergency and the simplicity of ram changing over the full range of sizes, which now extend from the 6-in. (7-in. bore) 15,000 psi working pressure to the 20-in. ($20\frac{1}{4}$-in. bore) 2,000 psi.

Cutaway units were demonstrated which showed clearly how Cameron research has provided in the new type "F" valve a means of withstanding the destructive effect of high-pressure abrasive flow. As research showed the downstream seat to suffer the most wear, and then mainly on that portion of the seat exposed as the gate moved into the initial opening or final closing position, rotating seats have been evolved. These move a fraction of a turn each time the valve is operated, and thus wear is spread evenly over the whole surface of the seat, and valve life is increased to a very considerable extent.

Examples of many other developments were seen during the visit, of particular interest being those connected with the new multiple completion techniques. The first four-in-one head was designed, manufactured, and delivered to a customer operating in the Gulf of Mexico within three weeks, and an impressive colored film of this quadruple completion was shown not long before in London to a large gathering of oil-company production personnel. This provided an added interest to *World Petroleum's* representative in seeing the manufacture of Cameron equipment in the Leeds works—now clearly on the verge of considerable expansion in volume and variety of output. END



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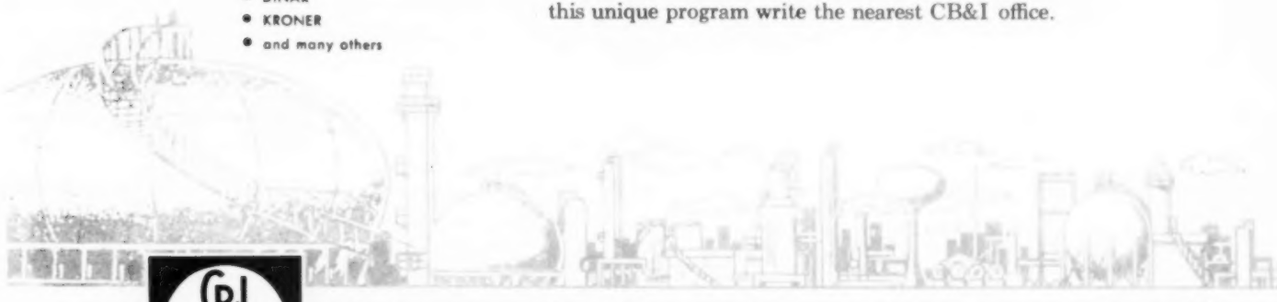

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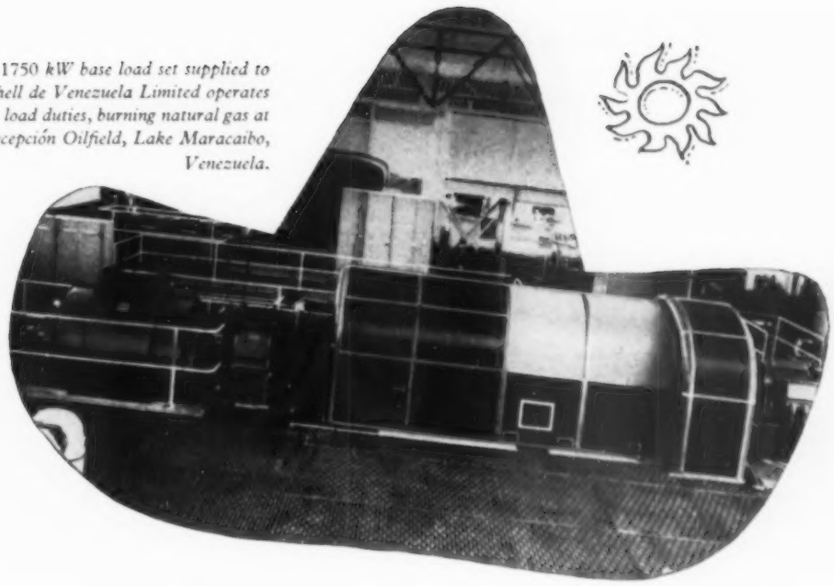

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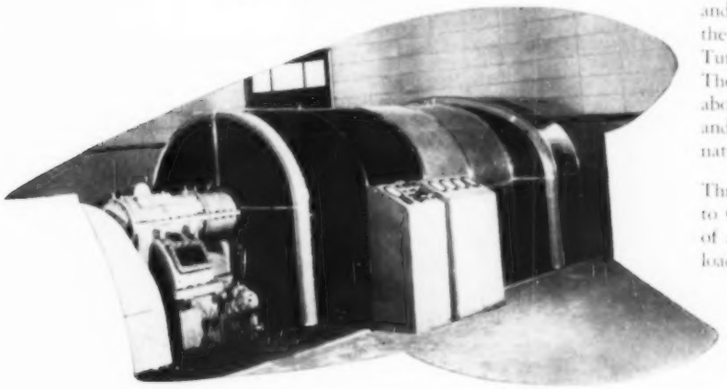

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Three 4,000 kW sets are being supplied to Gach Saran oilfield in Iran as a result of a recent order. These sets are for base load operation on natural gas.

A 4500 kW set has been manufactured for operation at Seria, British North Borneo.

The 2500 kW set installed at the Metropolitan Water Board's Ashford Common Pumping Station near Sunbury-on-Thames. This unit was supplied for peak load and standby operation, burning distillate oil fuel.

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(Continued from page 50)

*38. Paleogeographical Outline of the Northern Saharian Basins. Compagnie Francaise des Petroles d'Algerie; Societe Nationale de Recherche et d'Exploitation des Petroles en Algerie. France.

*39. The Development of Seismic Refraction in the Northern Sahara in Conjunction with the Progress Realized in its Geological Interpretation—Its Role in the Discovery and Study of the Hassi Messaoud Field. Compagnie Generale de Geophysique; Societe Nationale de Recherche et d'Exploitation des Petroles en Algerie; Compagnie Francaise des Petroles d'Algerie. France.

*40. Problems in Petroleum Exploration in the Paleozoic Northern Border Zone of the Hoggar. Compagnie deo Recherches et d'Exploitation de Petrole au Sahara. France.

41. Magnetics and Basement Tectonic Patterns. Gulf Oil Co. USA.

42. Regional Aeromagnetic Interpretation in Alberta. Geological Survey of Canada. Canada.

43. Gravity Measurements in the Central Valley of Chile. University of Chile. Chile.

44. The Structure of the Folded Molasse, of its Foreland and of the Adjoining Parts of the Alps in Western Bavaria by Means of Geophysical Measurements. Preussag. Germany.

45. Seismic Refraction Exploration of Faulted Limestone Structures in the Eastern foothills of the Canadian Rocky Mountains. Triad Oil Co., Ltd. Canada.

46. Seismic Mapping of Fault Zones in Middle and Northern Part of the Upper Rhine Graben. Winterschall AG. Germany.

47. Oil Exploration in the Molasse Zone of Western Austria. R. H. Janoschek. Austria.

48. The Oilfields of the Vienna Basin. K. Friedel. Austria.

49. Oil Basins of Argentina. Yacimientos Petroliferos Fiscales. Argentina.

50. Oil Basins of Brazil. Petrobas. Brazil.

51. Geology of the Brazilian Amazon Basin. Petrobas. Brazil.

52. Geology of Vogelkop, Netherlands New Guinea. Nederlandse Nieuw-Guinea Petroleum Maatschappij. The Netherlands.

*53. Petroleum Research in Southern Italy and its Geologic Bases. E. Beneo. Italy.

54. Jurassic and Cretaceous Microfacies from Pre-Alps and Central Apennines. University of Milan. Italy.

55. Survey of Exploration and Production of Oil in Yugoslavia. Association of Yugoslav Oil and Gas Industry. Yugoslavia.

56. Possible Oil Bearing Regions in India. Oil & Natural Gas Commission. India.

57. Withdrawn.

*58. Recent Progress in Sedimentology. International Association of Sedimentology. International.

59. The Appalachian Region. Appalachian Geological Society. USA.

SECTION II—DRILLING AND PRODUCTION

Sponsoring Director: C. E. Reistle, Jr. USA Program Committee Member: H. Decker.

1. Economics of Offshore Petroleum Development in the USA. Shell Oil Co. USA.

2. Conservation of Oil and Gas in the State of Texas Railroad Commission of Texas. USA.

3. Progress in the Theory and Practice of Oil and Gas-Field Developments in the USSR. Professor A. P. Krylov et al. USSR.

4. Oil Shale—Energy for the Future. Union Oil Co. of California. USA.

5. Special Features of Contract Drilling Outside North America. N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

*6. A Theoretical and Experimental Study of Drill String Stability in Turbodrilling. Its Relationship to Borehole Deviation. Societe Nationale de Petrole d'Aquitaine & Societe NEYRPIC. France.

7. Progress in Turbodrilling and Study of New Drilling Methods in the USSR. Professor R. A. Ioannesyan et al. USSR.

8. Air and Gas Drilling. Magnolia Petroleum Co. USA.

9. Shale Controlling Drilling Fluids. The Texas Co. USA.

*10. Drilling Problems Caused by High Formation Pressure Conditions in Some Areas of the Po-Valley: A Discussion of the Use of Bottom-hole Movers. Agip Mineraria. Italy.

11. Drilling and Production Operation in Lake Maracaibo. Creole Petroleum Corp. Compania Shell de Venezuela. Mobil Oil Co. de Venezuela. Mene Grande Oil Co. Venezuela.

12. Spacing of Wells. Yacimientos, Petroliferos, Fiscales. Argentina.

13. Automatic Production Control. Imperial Oil, Ltd. Canada.

14. Pays, Fluids and Reservoir Systems of the Main Structures of the Vienna Basin. H. Wieseneder et al. Austria.

15. The Pembina Oilfield, Alberta, Canada. An Example of a Low Permeability Reservoir. Mobil Oil of Canada, Ltd. Canada.

*16. Compressibility of Brines at Reservoir Conditions. Applications to Reservoir Engineering Problems. Agip Mineraria. Italy.

17. Development of Information for Evaluating In-Place and Recoverable Oil in a Subsurface Formation. Humble Oil & Refining Co. USA.

*18. The Continuous Poteclinometer-Dip meter. Societe de Prospection Electrique. France.

*19. Rock Type Distribution and Factors Affecting Ultimate Recovery in an Heterogeneous Carbonate Reservoir. Societe Esso de Recherche et d'Exploitation Petrolieres. France.

20. Fluid Injection for Increased Oil Recovery. Pan-American Petroleum Corp. USA.

21. Laboratory and Field Experiments on Fire Flood Recovery Method. Teikoku Oil Co., Ltd.; Tokyo University. Japan.

22. Mechanism of Oil Production by Underground Combustion. Koninklijke Shell Exploration and Production Research Laboratories; N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

23. Theoretical Principles of Hydraulic Fracturing of Oil Strata. Professor S. A. Christianovich et al. USSR.

24. Recovery Problems in a Fracture-Pore System, Kirkuk Field. Iraq Petroleum Co., Ltd. Gt. Britain.

25. Effect of Capillary and Gravitational Forces in the Water-Drive Process. Koninklijke Shell Exploration and Production Research Laboratories; N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

*26. Results Obtained in the Rumanian Fields from the Resaturation of the Oil Reservoirs. Institute of Petroleum Research, Campina, Rumania.

27. Results of Gas Injection in the LL-370 Area—Lake Maracaibo. Creole Petroleum Corp. Venezuela.

28. Relationship of Vapor-Liquid Equilibrium Ratios at Dewpoint Pressure to Compressibility Factors and Composition of Gas-Condensate Fluids. US Bureau of Mines. USA.

29. Agua Grande, One of the Good Fields of America. Geonisio Carvalho, Barroso & Ivan Carvalho. Brazil.

30. Recent Improvement & Development, Work Concerning Oil Shale Processing at Kvarntorp, Sweden. Edmund Schjanberg. Sweden.

31. Graphical Solution of Fluid Coning Problems in Oil Production. Petroleos Mexicanos. Mexico.

32. Future Performance of the Cretaceous Limestone of Lower Tamaulipas (Tamaulipas Field) as Controlled by Inert Gas Injection to Avoid the Static Pressure Declination. Petroleos Mexicanos. Mexico.

SECTION III—OIL PROCESSES AND REFINING

Sponsoring Director: H. W. Field. USA Program Committee Member: Dr. C. K. Viland.

1. The Refiner Looks at Cars of the Future. The Atlantic Refining Co. USA.

2. Processing Needs for Higher Quality Fuels. Universal Oil Products Co. USA.

3. A New Isomerization Process. Esso Research & Engineering Co. USA.

4. Reactions in Catalytic Reforming of Naphthas. Standard Oil Co. (Indiana); Esso Research & Engineering Co. USA.

5. Hydrogenation of Petroleum Fractions. Union Oil of California. USA.

*6. The IFP Hydrorefining Process for Crude Oils and Petroleum Fractions. Institut Francais du Petrole. France.

7. Cobalt Molybdenum Catalysts for Hydrodesulfurization and Reforming of Petroleum Fractions. Stazione Sperimentale Per I Combustibili; S.p.A. per l'Industria Petrolifera e Chimica; Societa Petrolifera Italiana. Italy.

8. Studies on a Commercial Two Stage Catalytic Cracking Plant. Shell Oil Co. USA.

9. Catalysts Based on Montmorillonite Mineral. Sudchemie AG. Germany.

10. Study of the Nature of Activity of Alumosilicate Catalysts. Professor K. V. Topchieva et al. USSR.

11. Chemical Changes in Lubricating Oil on Hydrofining. Imperial Oil, Ltd. Canada.

*12. Hydrofining in the Manufacture of Bright Stock. Esso Standard S. A. Francaise. France.

*13. Catalytic De-Aromatization of Light Distillates and the Hydro-Finishing of Lubricating Oils. Societe Francaise des Petroles BP. France.

14. Production of Lubricating Oils and Paraffin from Sulfurous Oils in the USSR. Professor L. G. Zherdeva et al. USSR.

15. Dehydrogenation of Naphthenic Lubricating Oil Fractions. Lobitos Oilfields, Ltd. Gt. Britain.

*16. Sweetening of Petroleum Products by Catalytic Oxidation with Sulfur Dyes. Compagnie Francaise de Raffinage. France.

17. Treating Aromatic By-Product Gasoline from Thermal Conversions by the BASF-Scholven Process for Light Oil Refining. Badische Anlin & Soda-Fabrick AG. Germany.

18. Development in Treating Processes for the Petroleum Industry. Koninklijke Shell Laboratorium. The Netherlands.

19. Refinery Studies by Digital Computer. Tidewater Oil Co. USA.

*20. Economic Studies of Refining Problems by Means of Modern Electronic Computers. Societe des Petroles Shell Berre. France.

21. Conjunct Polymerization of Ethylene with Heteropolyacid Catalysts. Delft Technical University. The Netherlands.

22. Extraction of Aromatics with Sulfolane. Shell Development Co. USA.

23. Gasoline Refining Using Adsorbents Selective for n-Paraffins. Standard Oil Co. (Ohio). USA.

24. Elementary Processes of Mass Transfer in Extraction, Absorption and Distillation. Institute of Chemical Technology, Braunschweig. Germany.

25. The Use of Gaseous Sulfur Trioxide in the Sulfonation of Petroleum Oils. Manchester Oil Refinery, Ltd. Gt. Britain.

26. Refining of Steam Cracked Gasoline. The British Petroleum Co., Ltd. Gt. Britain.

27. Twenty-Five Years with Fischer-Tropsch Fixed Bed Catalyst, its Present Standing and Possibilities for the Future. Ruhrchemie AG. Germany.

28. The Fluid Coking Process—Commercial Experience to Date. Esso Research & Engineering Co.; Tidewater Oil Co. USA.

29. Processes for Continuous Thermocontact Treatment of Oil Stocks on Coke. Professor B. K. Amerik et al. USSR.

30. Catalytic Processing of Residual Fuel Stocks. Houdry Process Corp. USA.

31. Importance of Hydrodesulfurization upon processing economy in a European refinery. Soc. Condor, RHO. Italy.

SECTION IV—CHEMICALS FROM PETROLEUM AND NATURAL GAS

Sponsoring Director: Dr. J. McAfee. USA Program Committee Member: Dr. J. Q. Cope.

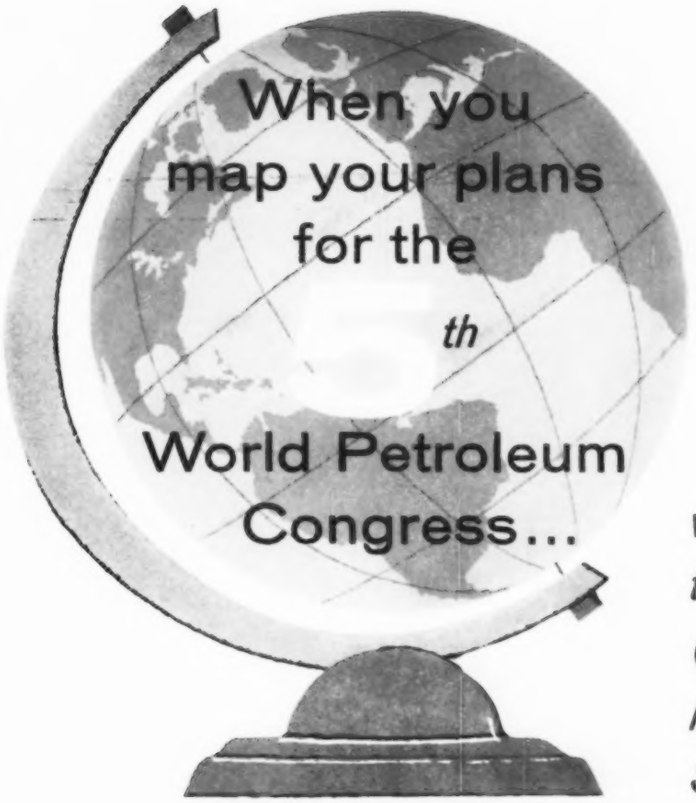
1. Manufacture and Utilization of Aromatics from Petroleum. Humble Oil & Refining Co. USA.

2. Two-Stage Process for Production of Naphthalene and High Octane Gasoline from Cycle Stock. Sinclair Research Laboratories, Inc. USA.

3. Catalytic Dehydrocyclization of Paraffinic Hydrocarbons. Professor B. A. Kazansky; Professor A. L. Liberman. USSR.

4. Kinetics of Pyrolysis of Ethane at Practical Conversions. Union Carbide Chemicals Co. USA.

5. Fundamental Relations of the Pyrolysis of Hydrocarbons to Acetylene and Ethylene. Farbwerke Hoechst AG. Germany. (more)



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6. Acetylene Production from Pyrolysis of Liquid Hydrocarbon Feedstocks. Societe Belge de l'Azote et des Produits Chimiques du Marly; M. W. Kellogg Co. Belgium.

7. Oxidative Cracking of Propane and Butane-Isobutane Mixtures. University of Pisa. Italy.

8. Cracking of Gaseous Hydrocarbons by Partial Oxidation. Badische Anilin & Sodafabrick AG. Germany.

9. Catalytic Synthesis of Cyclopentadiene Hydrocarbons. Professor N. I. Shuikin; Professor T. I. Naryshkina. USSR.

10. Butadiene Production—Commercial Practice with Dow Catalyst. Dow Chemical Co. USA.

*11. A Process for Manufacturing Isoprene. Institut Francais du Petrole. France.

*12. Manufacture of Conjugated Diolefins by Hydroperoxidation of Olefins. Institut Francais du Petrole. France.

13. The Production of Synthesis Gas by Partial Oxidation. The Texas Co. USA.

14. Recent Developments in the Oxo Process. Gulf Research and Development Co. USA.

15. Synthesis of Higher Aliphatic Alcohols by Direct Oxidation of Paraffinic Hydrocarbons. Professor A. N. Bashkirov; Professor V. V. Kamzolkin. USSR.

16. Hydrogen Peroxide—New Techniques for its Utilization. Shell Development Co. USA.

17. A New Process for Oxidation of Aromatics. Standard Oil Co. (Indiana). USA.

18. Production of Aromatic Dicarboxylic Acids. Koninklijke Shell Laboratorium; N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

19. Acetic Aldehyde as Raw Material for Acrylonitrile. The Knapsack Process. Knapsack Griesheim AG. Germany.

20. Detergent Alkylsulfonates Derived from Petroleum Hydrocarbons through Hydroperoxides. Kadimah Chemical Corp. Israel.

21. Relationship between Structure of Phenyldodecane Isomers and Performance as Detergent Base Materials. Koninklijke Shell Laboratorium; N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

22. Polymers of Ethylene—Two Decades of Progress in Control of Structure. E. I. du Pont de Nemours & Co. USA.

23. New Plastics from Petroleum. Montecatini Co. Italy.

24. New Classes of Plastic, Rubbers, and Textile Fibers from Petroleum. Instituto di Chimica Industriale Politecnico di Milano. Italy.

25. Some Relationships of Polymerization of Alpha-Olefins on Complex Metal-Organic and Oxide Catalysts. Professor A. V. Topchiev; Professor B. A. Krentsel. USSR.

26. Polymerization of Acetylene and Homologs. Phillips Petroleum Co. USA.

27. Oil Extension of Synthetic Rubbers. Polymer Corp. Canada.

28. Summary of the Synthetic Fiber Industry. Chemstrand Corp. USA.

29. Improved Process for Sulfur Recovery from Refinery Gases. The Atlantic Refining Co. USA.

30. Thianaphthene and Homologs from Hydrocarbons and Hydrogen Sulfide. The Texas Co. USA.

31. Integration of Petroleum Chemicals Operations. Imperial Chemical Industries, Ltd. Gt. Britain.

SECTION V—COMPOSITION, ANALYSIS AND TESTING

Sponsoring Director: Dr. W. E. Kuhn. USA
Program Committee Member: H. Levin.

1. Some Advances in Extreme Ultraviolet Spectrophotometry. Esso Research & Engineering Co. USA.

2. Analytical Application of Near Infrared Spectroscopy. Shell Development Co. USA.

3. The Present Status of the Infrared Study of Chemisorbed Molecules. The Texas Co. USA.

4. Gas Chromatography Guides, Development of Paraffin Isomerization Processes. Standard Oil Co. (Indiana). USA.

5. Continuous Separation of Multicomponent Mixtures by Gas Chromatography. University of Basle. Switzerland.

*6. The Application of Gas Chromatography in the Analysis of Crude Oils. Laboratoires de Recherches Purfina S.A. Belgium.

*7. French Contribution to the Application of Spectrographic and Chromatographic Methods to the Petroleum Industry. a. Some Applications of Spectrographic and Chromatographic Methods of Analysis in the Petroleum Industry. b. Applications of Infra-Red Analysis in the Petroleum Industry. Societe Esso Standard; Compagnie Francaise de Raffinage. France.

8. Refining Application of Nuclear Magnetic Resonance Spectrometry. Humble Oil & Refining Co. USA.

9. Analytical Applications for Ion Exchange Resins in the Petroleum Industry. "Shell" Research, Ltd. Gt. Britain.

10. Petroporphyrins. Johns Hopkins University. USA.

*11. Identification and Properties of Porphyrin Bodies in Residues and Bituments. Societa Aquila-Trieste; Instituto di Chimica Applicata; University of Trieste. Italy.

*12. Constitution of Cyclic Sulfur Compounds in Petroleum—Separation and Identification. Compagnie Francaise de Raffinage. France.

*13. Trace Elements Analysis in Petroleum Products. Institut Francais du Petrole. France.

14. Minor Constituents of a California Petroleum. U. S. Bureau of Mines. USA.

15. Study of the Chemical Composition of Gasolines Containing Unsaturated Hydrocarbons. Professor A. V. Topchiev et al. USSR.

16. Physical Properties and Molecular Structure in Fused Polycyclic Hydrocarbon Systems. Pennsylvania State University. USA.

17. Withdrawn.

18. New Developments and Principles of the Work of the API Research Project 6 on Hydrocarbons in Petroleum. Carnegie Institute of Technology. USA.

19. Composition of Chromatographic and Thermal Diffusion Fractions of Typical Asphalts. The Texas Co. USA.

20. The Constitution of High-Molecular-Weight Petroleum Products, Especially of Asphaltic Bitumen. Deutsche Erdol AG. Germany.

*21. Research on Asphaltenes and Asphaltic Crudes. Stazione Sperimentale per i Combustibili. Italy.

22. Evaluation of Gear Oils under Conditions of Boundary Lubrication. Dr. Ing. G. Schultze et al. Germany.

23. Laboratory Screening Tests for Lube Oil Detergents and Dispersants. Lubrizol Corp. USA.

24. Some European Questions on Multigrade Lubricating Oils. Societa Lombarda Petroli. Italy.

25. Contribution to the Investigation of Some Factors Affecting Dielectric Behaviour of Mineral Oils. L. Chiabotto. Italy.

26. Relationships of the Physical Properties of Hydrocarbons. V. G. Aranda. Spain.

27. A Contribution to Viscometry; Hydrodynamic Study on Capillary Viscometry. Showa Oil Co., Ltd. Japan.

28. On the Oiliness of Lublicants Measured in Various Atmospheres. Tokyo University; Tokyo Metropolitan University; Tokyo Technical University; Nippon Oil Company; Mitsubishi Oil Company. Japan.

29. The Ultrasonic Velocity in Hydrocarbons and their Mixtures in Relation to their Surface Tension. Delft Technical University. The Netherlands.

**30. Viscosity—Temperature Relationships of Lubricating Oils. The International Committee on Rheology. International.

31. Some Specific Aspects of Extraction-Asphalts in the Light of Extended Testing Methods. Mgr. Inz. L. Kossowicz. Poland.

*To be presented in a separate one-day symposium on this subject and printed as part of Section V.

SECTION VI—UTILIZATION OF PETROLEUM PRODUCTS

Sponsoring Director: Dr. J. C. Zimmer. USA
Program Committee Member: A. J. Blackwood.

*1. French Solution to the Problems of Multifuel Engines. Societe Grossol; Institut Francais du Petrole. France.

2. Development of German Multifuel Diesel Engines and their Significance. Battele Institute, Frankfurt. Germnay.

*3. New Developments in the Technique of Free Piston Gasifiers Obtained by Use of Post-Combustion, Supercharging, and Twinning. Application to the Petroleum Industry. Societe Industrielle Generale de Mecanique Applique. France.

4. Swiss Experience with Fuel Additives in Gas Turbines. Brown, Boveri & Cie.; Escher Wyss AG; Oerlikon Engineering Co.; Sulzer Bros., Ltd. Switzerland.

5. Advances in Gas Turbines and Free Piston Engines and their Effect on the Petroleum Industry. The Texas Co. USA.

6. Economic Aspects of Raising Compression Ratio and Octane Quality. Standard Oil Co. (Indiana). USA.

7. Comparison of Performance and Octane Number Requirements of American and European cars. Mobil Oil Co., Ltd., Mobil Oil AG, Mobil Oil Italiana, S.p.A., Mobil Oil Francaise. Germany.

8. Road Octane Number of Past, Present and Future Gasolines. Esso Research, Ltd. Gt. Britain.

9. Octane Requirements of Total Passenger Cars in Italy. Ente Nazionale Idrocarbini. Italy.

10. Antiknock Compounds—Research, Development, and Refinery Application. Ethyl Corp. USA.

11. A Review of Research on Abnormal Combustion Phenomena in Internal Combustion Engines. Shell Oil Co. USA.

12. Oxidation Inhibitors for Modern Fuels. Shell Development Co. USA.

13. Investigations into the Composition of Diesel Engine Exhausts. The British Petroleum Co., Ltd. Gt. Britain.

14. Small Equipment for Engine Testing of Jet Fuels. Dr. G. Spengler. Germany.

15. New Soap-Thickener System Extends Range of Multipurpose Greases. Esso Research & Engineering Co. USA.

16. Non-Soap Lubricating Greases. Standard Oil Co. (Indiana). USA.

17. The Development of Modern Hydraulic and Steam Turbine Oils in View of Increased EP Requirements. BP Benzin and Petroleum AG. Germany.

18. Colloid Aspects of the Performance of Oil-Soluble Soaps as Lubricant Additives. U. S. Naval Research Laboratory. USA.

19. The Bearing Performance and Elastic Properties of Polymer Thickened Lubricating Oils. Esso Research & Engineering Co. USA.

20. Synthetic Additives for Lubricating Oils. Influence of Additive Structure on their Activity. Professor P. I. Sanin et al USSR.

21. The Mechanism of Boundary Lubrication with Special Reference to Titanium. Massachusetts Institute of Technology. USA.

22. Cutting Fluids. The Texas Co. USA.

23. Effects of High Temperature on Friction and Wear. California Research Corp. USA.

24. Trends in Marine Lubrication. Mobil Oil Company, Ltd. Gt. Britain.

25. Clean, Efficient Combustion of Heating Oil. Esso Research & Engineering Co. USA.

26. Industrial Applications of Residual Fuel Oil. Esso Petroleum Co., Ltd. Gt. Britain.

27. Durability of Bitumen in Theory and Practice. Koninklijke Shell Laboratorium; N.V. De Bataafsche Petroleum Maatschappij. The Netherlands.

28. Withdrawn.

29. Road and Laboratory Experiments on Asphalt from Western Hemisphere and Middle East Crudes. Esso Research, Ltd. Gt. Britain.

30. The Properties of Petroleums that Supply World Trade Especially Venezuelan Petroleums. Ministry of Mines and Hydrocarbons. Venezuela.

SECTION VII—ENGINEERING, EQUIPMENT AND MATERIALS

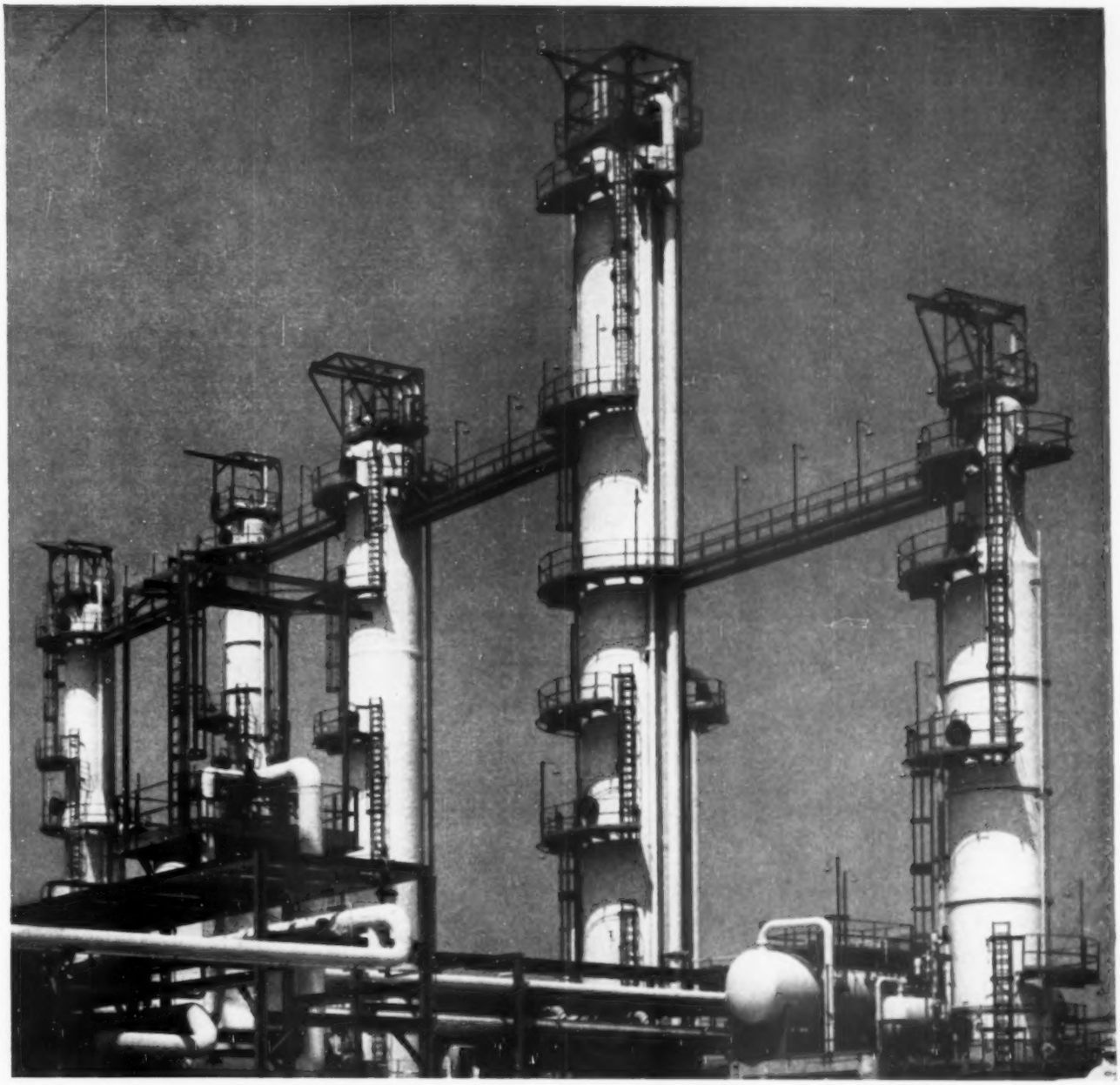
Sponsoring Director: H. B. Nichols. USA
Program Committee Member: S. D. Dalton.

1. Pollution and Prevention Through Design and Operation. Shell Refining & Marketing Co., Ltd. Gt. Britain.

2. Pollution Prevention Through Design and Operation. General Petroleum Corp. USA.

3. Decomposition of Naphthenic Acids by Micro-Organisms in a Refinery Effluent Disposal System. Shell Refining & Marketing Co., Ltd. Gt. Britain.

4. Erosion in Gas-Solid Systems. Konin-



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klijke/Shell Laboratorium; N.V. De Bataafsche Petroleum Maatschappij. The Netherlands.

5. Dynamics and Control of Distillation Columns. Koninklijke/Shell Laboratorium; N.V. De Bataafsche Petroleum Maatschappij. The Netherlands.

6. Application of Hydraulic Systems in Petroleum Industry. Delft Technical University. The Netherlands.

7. Reconciliation of American and European Steel Specifications. Esso Research & Engineering Co. USA.

8. Some Aspects of Corrosion Prevention in a Refinery. The British Petroleum Co., Ltd. Gt. Britain.

9. Metallurgical Aspects of Quality Control in Production of Petroleum Equipment. Kellogg International. Gt. Britain.

10. Epoxy Resin Coatings in the Oil Industry. Shell Development Co. USA.

11. Fire-Side Corrosion in Oil-Fired Boilers. The British Petroleum Co., Ltd. Gt. Britain.

12. Corrosion and its Prevention for Oil Tankers. Transportation Technical Research Institute; The Nippon Corrosion Engineering Co., Ltd. Japan.

13. Advances in Process Plant Engineering. The M. W. Kellogg Co. USA.

14. Use of a Large Computer in Making Economic Designs. Esso Research & Engineering Co. USA.

15. Data-Logging, Scanning, and Information Systems get All-Out Test at New Tidewater Delaware Refinery. Tidewater Oil Co. USA.

16. Principles of Improving Flow Reactor Efficiency in Petrochemical Processes. Professor A. N. Planovsky; Professor D. I. Orochko. USSR.

*17. The Present Status in France in the Utilization of Steel Tubing Designed to Resist Special Corrosion Conditions and in the Measurement of Corrosion. Societe des Forges et Ateliers duCreusot; Acieries de Pompey; Compagnie des Ateliers et Forges de la Loire; Societe Lorraine-Escaut; Societe Vallourec; Acieries d'Ugine; Compagnie des Tubes de Normandie. France.

18. Reinforcements, Round Holes and Spherically Curved Parts of Pressure Vessels. Government Supervision Service for Boilers & Pressure Vessels. The Netherlands.

19. Causes and Prevention of Explosions in Petroleum Processes. Standard Oil Co. (Indiana). USA.

20. Fire Protection in Petroleum Industries. Ing. H. Brunswig. Germany.

21. Withdrawn.

22. A Theory of Complex Recycle Processes for Petrochemical Synthesis. Professor M. F. Nagiev. USSR.

23. Noise Problems in a Large Refinery. Esso Petroleum Co., Ltd. Gt. Britain.

SECTION VIII–TRANSPORTATION AND DISTRIBUTION

Sponsoring Director: Dr. W. C. Kinsolving. USA Program Committee Member: D. B. Hodges.

1. The Role of Sea Transport in the Petroleum Industry. Standard Oil Co. (N. J.). USA.

2. Operations Research Applied to Marine Transportation and Tankage Problems. Creole Petroleum Corp.; Esso Research and Engineering Co. Venezuela.

3. Marine Transportation of Liquid Methane. Continental Oil Co. USA.

4. The Significance of the Increasing Number and Size of Diesel Tankers for Economic Transportation of Fuel. Burmeister & Wain. Denmark.

*5. Progress and Dimensions of Tankers. Compagnie Navale des Petroles. France.

6. Industrial Methods for Building Oil Tanks in the Soviet Union. Professor E. A. Ignatchenko et al. USSR.

7. Earthen Reservoirs Storage of Petroleum. Creole Petroleum Corp. Venezuela.

8. The Use of Mined Caverns for the Storage of Liquefied Light Hydrocarbons. Sun Oil Co. USA.

*9. Techniques Employed in the Study and in the Development of Subterranean Gas Storage in Water-Drive Reservoirs. Institut Francais du Petrole; Gaz de France; Societe Nationale des Petroles d'Aquitaine. France.

10. Engineering and Theoretical Studies of Static Electricity in Fuels. Esso Research & Engineering Co. USA.

11. Experience in Turbine Fuel Quality Control. Shell Oil Co. USA.

12. Microwave Communication in Pipeline Operation. Platte Pipe Line Co. USA.

13. Automation in Pipeline Transportation of Liquid and Gaseous Hydrocarbons. Societa Nazionale Metanodotti. Italy.

14. Scheduling and Control of Multiple Pipeline Tenders by Electronic Computer. Plantation Pipe Line Co. USA.

15. Construction, Operation and Maintenance of Offshore Pipelines. Collins Construction Co. USA.

16. Electrical Heating of Pipelines Carrying Viscous Crudes. The British Petroleum Co., Ltd. Gt. Britain.

17. Synthetic Pipeline Coatings. Esso Research & Engineering Co. USA.

18. Custody Transfer by Displacement Meters. Humble Pipe Line Co. USA.

19. The Truck Dispatching Problem. Rand Corp.; Atlantic Refining Co. USA.

20. Current Marketing Research Methodology in the American Petroleum Industry. Standard Oil Co. (Indiana). USA.

SECTION IX–OPERATIONS RESEARCH STATISTICS AND EDUCATION

Sponsoring Director: J. K. Roberts. USA Program Committee Member: J. W. Boatwright.

1. Petroleum's Contribution to Modern Society. Hamline University. USA.

2. Statistical Data Required for Industrial Management. The United Nations. USA.

3. Basic Factors that Will Shape Future Oil Requirements and Supplies. W. J. Levy. USA.

4. The Role of Petroleum in World Energy Supplies. Standard Oil Co. of California. USA.

5. The Future Energy Requirements of the World and the Importance of Petroleum as One of the Forms of Primary Energy. P. R. de Ryckere. Belgium.

6. The Search for Petroleum Outside the United States. The Chase Manhattan Bank. USA.

7. Monetary Aspects of World Oil. The First National City Bank of New York. USA.

8. On Multiple Rates of Return. Shell Oil Co. USA.

9. Economics of Refinery Location in the United States. S. M. Livingston. USA.

10. Current Economic Trends in Size and Location of Refineries. P. H. Frankel. Gt. Britain.

11. A Method for Solving the Fixed-Charge Problem and some of its Applications. N. V. De Bataafsche Petroleum Maatschappij. The Netherlands.

12. Methods of Economic Analysis in the Petroleum Industry, Including Field Development. Esso Petroleum Co., Ltd. Gt. Britain.

13. Mathematical Tools in Optimization of Operations. Tidewater Oil Co. USA.

14. Making Use of Exploratory and Oil Developments Statistical Data. Eng. E. Ospina-Racines. Colombia.

15. Information Research—A New Tool for Petroleum Progress. Esso Research & Engineering Co.; Jersey Production Research Co. USA.

16. Withdrawn.

17. Withdrawn.

18. Higher and Secondary Petroleum Education in the Soviet Union. Professor K. F. Zhigach et al. USSR.

19. Sources of Statistical Information for the Petroleum Industry. Standard Oil Co. of California. USA.

20. India's Energy Requirements and the Role of Petroleum Burma-Shell Oil Storage and Distributing Co.; Ministry of Steel, Mines, and Fuel. India.

SECTION X–SYMPOSIUM ON THE APPLICATIONS OF ATOMIC ENERGY TO THE PETROLEUM INDUSTRY

Sponsoring Director: E. V. Murphree. USA Program Committee Member: Dr. R. L. Doan.

1. Probable Impact of Atomic Energy on the World Petroleum Industry. Dr. Robert E. Wilson. USA.

2. Peaceful Uses of Atomic Explosives. University of California. USA.

3. Technical and Economic Prospects of Atomic Energy in the Petroleum Industry. Schlumberger Well Surveying Corp. USA.

4. A Novel Approach to Control of Separation Processes Using Radioisotopic Compounds. California Research Corp. USA.

5. Recoil Tagging of Petroleum Hydrocarbons. Shell Oil Co. USA.

6. Radioisotopes in Fuel and Lubricant Research. Esso Research & Engineering Co. USA.

7. The Use of Short-Lived Tracers in Petroleum Applications. Tracerlab, Inc. USA.

*8. Some Special Aspects of Radiolysis of Hydrocarbons in Liquid Phase. Compagnie Francaise de Raffinage. France.

9. Radiation Promoted Hydrocarbon Reactions. Esso Research & Engineering Co. USA.

10. Radiation Chemistry of Light Hydrocarbons. Humble Oil & Refining Co. USA.

11. Studies in the Radiation Chemistry of Petroleum Hydrocarbons and the Applications of Nuclear Radiation to the Petroleum Industry and Petrochemical Synthesis. Professor A. V. Topchiev et al. USSR.

12. Effect of Gamma Irradiation on the Thermal Decomposition of Light Paraffinic Hydrocarbons. Esso Research, Ltd. Gt. Britain.

13. Effect of Radiation on the Stability of Synthetic Lubricants. Shell Development Co. USA.

14. Lubrication Requirements of Nuclear Power Plants. Shell Petroleum Co., Ltd. Gt. Britain.

15. Use of the Methods of Atomic Physics in Oil Prospecting and Production. Professor G. N. Flerov et al. USSR.

16. Nuclear Well-Logging in Exploration and Production Problems. Gulf Research and Development Co. USA.

17. Recent Advances in the Use of Nuclear Physics in Oil Well Surveys. Well Surveys, Inc. USA.

END

Gas-Turbine Operations Committee visits Clark Bros. Division of Dresser Industries in Olean, N.Y.: From left to right: J. J. Rosecky, Clark Bros; R. J. Parks—Aramco; J. E. Fenex—Petroleum Chemicals Inc.; J. E. Leo—Trans-Arabian Pipeline Co.; C. A. Falkenhagen—Tennessee Gas Transmission; G. H. Ewing—Texas Eastern Transmission; A. H. Carameros—El Paso Natural Gas; F. A. Cramer—Southern Counties Gas; M. M. Heller—United Gas Co.; R. M. Greene and R. J. Spears—Clark Bros Co.

Frank O. Prior (left), chairman of Standard Oil Co. (Indiana), accepts a check for more than $182 million presented by Walter W. Wilson, senior partner of Morgan Stanley & Co. The check—for $182,162,193.75—represents the first payment toward more than $190 million realized from sale of $200 million in debentures. Witnessing delivery of the check are David Graham, Standard Oil financial vice president, and Homer J. Livingston, president of The First National Bank of Chicago.

"Let's do an abstract," said the artist for the hundredth time.
"You pipe down," we answered, "and let us get on with selling Darlington Insulation."
"Pipes!" cried the artist. "Your insulated pipes can't help looking abstract. It's the shape they are. Anyway, there's nothing abstract about insulation that cuts heat loss to only 10%. You've said so yourself hundreds of times."
So we let him do his abstract and here it is.

But we forced him to leave room for us to say that you will find Darlington Insulation saving money on pipes of all kinds—pipes for steam, for oil, and for many other basic materials of industry—all over the world. If you'd like to know more, please write to us.

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A MEMBER OF THE DARLINGTON GROUP OF COMPANIES

OIL COMPANY STAFF CHANGES

P. A. Taylor

J. K. Jamieson

P. A. TAYLOR has been named manager of production for the newly acquired Mobil interests in Gabon and the Middle Congo in West Africa. He took up his new post, headquartered in Paris, France, late in November.

Mr. Taylor has been chief petroleum engineer for Mobil Oil of Canada, in Calgary, since 1953. He joined Mobil in 1952. Previously he had worked with Royal Dutch Shell in many parts of the world, including Romania, Holland, Venezuela, Columbia, Trinidad, and Egypt.

W. A. MYERS has been appointed acting manager of the research and development department of The Atlantic Refining Co., Philadelphia, Pa.

Mr. Myers will assure direction of the department previously managed by H. W. FIELD, who, for reasons of health, has been granted a leave of absence. At his request, Dr. Field has been relieved of his managerial responsibilities and has resigned as a director and vice president of Atlantic.

Mr. Myers joined Atlantic's research and development department in 1927, and has served as assistant general manager since 1947.

IRA H. CRAM, senior vice president and chairman of Continental Oil Co.'s executive committee, and **HOWARD H. HINSON,** vice president in charge of the foreign department, both of Houston, established new headquarters in New York, N. Y. on January 1.

At the same time **E. W. WEBB,** Houston, was promoted to senior vice president, responsible for Conoco's exploration and production activities in the United States and Canada. Formerly administrative vice president in charge of the company's production department, he will continue to make his headquarters in Houston.

SAM L. JACKSON has been appointed manager of operations in the supply and transportation department of Standard Oil Co. (Indiana). Formerly transportation manager, he succeeds Richard E. Nelson, Jr., named earlier as president of the newly organized Amoco Trading Corp. in New York, a Standard Oil Co. affiliate. Appointments of Creed F. Gearhart to succeed Mr. Jackson and Lyle W. (Bill) Ewing, Jr., to succeed Mr. Gearhart as chief engineer, also have been announced.

ARTHUR M. MOUSER has been named manager of the gas-utilization department of Tidewater Oil Co.'s central and southern divisions, with offices in Tidewater's southern division headquarters in Houston, Texas.

E. WALDO EMERSON, general manager of Gulf Oil Corp.'s New York sales division, retired at the end of 1958. Mr. Emerson's maternal grandfather, R. D. Benson, was founder and first president of Tidewater Oil Co. His paternal grandparent, E. O. Emerson, was a co-founder with Joseph N. Pew of the Sun Oil Co.

MICHAEL L. HAIDER, president of International Petroleum Co. Ltd., has been elected director of Standard Oil Co. (New Jersey). At the same time, **HINES H. BAKER,** who has spend more than 39 years in the oil business, announced his resignation as a director and a member of the Jersey Standard executive committee. Both actions were effective January 1, 1959.

Mr. Haider has served since April 1, 1954, as president of International Petroleum, a Jersey affiliate whose principal activities are in Colombia, Peru, and Venezuela.

J. K. JAMIESON, of International Petroleum Co. Ltd., has been elected president and director effective January 1. He succeeds M. L. Haider, resigned to become a director of Standard Oil (N.J.), Mr. Jamieson has been a vice president and director of Imperial Oil Ltd. in Canada.

Mr. Jamieson attended the University of Alberta (Canada), and is an MIT graduate with a B.S. degree. He began in oil in 1932, and has since covered all major phases of the industry. He joined British American Oil Co. in 1934. He joined Imperial Oil in 1948. In April 1952 he was elected a director of Imperial Oil, and one year later became a vice president.

JOHN L. LUGLI has been appointed senior engineer in The Texas Co.'s petrochemical department at New York. He formerly was in the process engineering group at the Lockport, Ill., refinery.

MYLES J. CONNOR, Jr., has been appointed an assistant director in the planning engineering division of Esso Research and Engineering Co. He is in charge of the division's operations research activities. In the past 10 years with Esso, he has spent four years on field assignments in the USA, Europe, and South America. His initial work with the company was concerned with process and design engineering.

General **JAMES H. DOOLITTLE** has retired as vice president of Shell Oil Co., but he will become board chairman of Space Technology Laboratories, Inglewood, Calif.

General Doolittle has been with Shell since 1930, when he left active duty with the United States Army Air Corps to become manager of the company's aviation department. He has been a vice president and director since 1946.

W. C. WENZEL, formerly executive manager of Pennsylvania Grade Crude Oil Assn., has been elected president of Executive Job Counselors Inc., which advises professional and management men on executive development, appraisal, and career progress situations.

ALVIN R. MARTIN has been appointed head of the Law Departments of Gulf Eastern and Gulf European Companies, Eastern Hemisphere subsidiaries of Gulf Oil Corp. He will headquarter in Gulf House, London. In his new position, Mr. Martin will succeed Laszlo Gombos.

WILLIAM A. LYON and FRANK M. PORTER have been elected advisory directors of Chemical Corn Exchange Bank. Mr. Porter, who is president of the American Petroleum Institute and also of Fain-Porter Drilling Co., becomes a member of Chemical's Rockefeller Center Advisory Board.

RAY O. SHAFFER, Fort Worth, president and board chairman of Welex Inc., has been elected a director of Continental Oil Co. He succeeds Arthur W. Page, New York business consultant and formerly a director and vice president of the AT&T, who resigned after having served nearly 20 years on Conoco's board.

Mr. Shaffer became president of Welex, an oil-well service company, in 1950, after having served several years on its board. He is also president of Welex of Venezuela and Welex of Canada. In August 1958, he was elected board chairman of the Reed Roller Bit Co., Houston. He also is a director of the Halliburton Oil Well Cementing Co.

H. H. Baker

M. L. Haider

G. Williams

K. W. Ellis

KENNETH W. ELLIS, finance manager, and **GEORGE WILLIAMS,** chief of exploration, have been appointed to the boards of both Brunei Shell Petroleum Co. Ltd. and Sarawak Shell Oilfields Ltd.

Mr. Ellis joined the Shell group in April 1948, serving first with Cia. Shell de Venezuela, in Maracaibo and Caracas. He succeeds **CYRIL N. CHATER,** who retired November 1. Mr. Williams joined Shell in 1946. He was appointed chief of exploration in Borneo in January 1958, following the transfer of Dr. Charles E. Thiebaud.

JAYE F. DYER has joined the staff of Apache Oil Corp. Tulsa, Okla., as division geologist in charge of new areas. Mr. Dyer formerly was exploration manager for Anderson-Prichard Oil Corp. in its Rocky Mountain area. Before that he was with Cities Service Oil Co.

W. C. SUMMY and **R. J. TANSEY** have been appointed vice presidents of Sinclair Venezuelan Oil Co. Mr. Summy is general production superintendent for Sinclair in Venezuela, and Mr. Tansey is assistant treasurer of the company there. Both have been associated with the Sinclair organization for over 30 years.

E. DUER REEVES has been elected executive vice president of Esso Standard Oil Co. He also has been elected a director and vice chairman of the executive committee of the Esso board. The post has been vacant since August 1, when William Naden was elected president of Esso Standard.

Mr. Reeves has served as executive vice president of the Esso Research and Engineering Co. since 1949. He has been associated with a number of Esso Research's major accomplishments, including the development of fluid catalytic cracking and butyl rubber. He joined the company in 1930.

R. G. Searight

E. D. Reeves

R. G. SEARIGHT has joined the Iraq, Basrah, and Mosul Petroleum Companies to become chief representative in Iraq. His headquarters will be in Baghdad.

Mr. Searight came to the companies with 30 years' experience in the international oil industry. He joined Dutch-Shell group in 1928, and first went to Egypt in 1931. In 1937 he came to USA for Shell Petroleum Corp. Returning to London in 1939, in the following year—after a short period in Romania—he went to Egypt for three years, part of which he spent in H. M. Services and part with Shell Co. of Egypt. After war service in North Africa and Italy, early in 1945 Mr. Searight returned to Egypt as assistant general manager, and in 1947 was appointed general manager of Shell Co. of Egypt Ltd. and Anglo-Egyptian Oilfields Ltd.—becoming chairman and managing director of the latter in 1951. He held these appointments until mid-1952, when he left Egypt for London. In 1953 he was appointed manager of production administration, and in 1956 manager of Middle East Partnerships of Dutch-Shell group, in which post he remained until his recent appointment.

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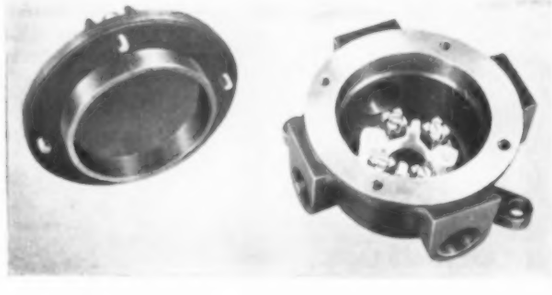
G.E.C.

Designed to the latest British Standard Specification 229-1957. *Certified by Ministry of Fuel and Power for use in gases included in Groups* II *and* IIIa. *Certificate No. FLP.*3900-1957.

The G.E.C. range of circular flameproof junction boxes now includes this new weatherproof type for use in exposed positions. It is made with a machined spigot joint and weatherproof seal in planes at right angles to one another. Apart from its overall height this new box is similar in dimensions to the G.E.C. standard CF8421/8436 flameproof range of boxes.

SPECIAL FEATURES INCLUDE:

- **Weatherproof pattern interchangeable with G.E.C. standard flameproof range.**
- **Large internal dimensions.**
- **Sealing gasket of Neoprene 1/16 in. thick x 5/8 in. wide.**
- **Boxes are available in 4-way (intersection) type with two stopper plugs.**
- **Boxes can be used as two, three or four way by altering stopper positions.**



THE GENERAL ELECTRIC COMPANY LIMITED
MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

R. L. BANKER has been named supervisor of engineering section in Shell Oil Co.'s general tax department, in New York.

JOHN N. GRAY and **WALLACE H. COCHRANE** have formed the Gray-Cochrane Corp., petroleum consultants, with offices at 203 C. A. Johnson Bldg., Denver 2, Colo. Mr. Gray resigned as district superintendent for eastern Venezuela after 21 years with Sinclair Venezuelan Oil Co. W. H. Cochrane has been an independent geological consultant for several years in Denver. Edward R. Haymaker was recently a consulting engineer with Ball Associates.

WALTER SQUIRES, Jr., has been appointed an engineering associate, and BROOK I. SMITH a senior engineering associate, of Esso Research & Engineering associate, of Esso Research & Engineering Co., Linden, N.J.

ROBERT H. ROWLAND, of San Francisco, has been named manager of the Hawaiian refinery of Standard Oil Co. of California, Western Operations Inc., now under construction near Honolulu. The plant is scheduled to begin initial operations in late 1960.

A native of Oklahoma, Mr. Rowland was graduated by the University of Michigan, and joined Standard's Richmond, Calif., refinery in 1938. In 1947 he was appointed superintendent of the Perth Amboy, N. J., refinery of California Oil Co., a Standard operating company, and was named manager there in 1950. He returned to Standard's home office at San Francisco in March of 1958.

PAUL W. McFARLAND has been appointed manager of Sun Oil Co.'s Latin American production division which currently is carrying on exploration and production in Venezuela, Colombia, Guatemala, Cuba, and the Bahamas. Mr. McFarland, who has been finding oil for Sun for 35 years, succeeds **BENTON E. WARREN**, who died November 10. **LEE C. SMITH** replaces Mr. McFarland as exploration manager for the division.

Mr. McFarland joined Sun in 1923 as a geologist in Venezuela. Mr. Smith began his career with Sun in 1923 as paleontologist at Dallas. He was appointed assistant chief geologist for the Latin American division in February 1958, becoming chief geologist in July.

C. R. ELDER, Jr., general superintendent, has just been elected a vice president and director of Sohio Pipe Line Co., Cleveland, Ohio. Mr. Elder joined Sohio in 1947 as an engineer.

E. E. AINE has been appointed superintendent of Texaco's Los Angeles, Calif., refinery. He succeeds W. J. Ryan, retired. **GEORGE LOUIS** will succeed Mr. Aine as assistant superintendent. He formerly was supervisor of the crude-still area at the Los Angeles works.

FRED P. SWELL, vice president for manufacturing and marketing, and his assistant, **CARROLL C. COOK**, have moved into Dehli-Taylor Oil Co.'s main offices in Dallas, Texas. The manufacturing headquarters had been at Dehli-Taylor's refinery in Corpus Christi, Texas.

J. J. BROWNE will become Rocky Mountain division superintendent at Salt Lake City, Utah, for General Petroleum Corp.'s production division—succeeding Aldon L. Hair, retired. P. M. BARRY becomes a special assistant in the Los Angeles office; and **W. G. CHRISTENSEN** becomes assistant to the manager of joint-venture operations in Los Angeles.

P. S. GEIGER retired recently as division land man of The Ohio Oil Co.'s Los Angeles (Calif.) production division, after 30 years' service. He has been succeeded by **J. L. CLYMER**, formerly district land man of Ohio Oil's Bakersfield (Calif.) district office.

BENJAMIN G. SYMON, formerly industrial products manager of Shell Oil Co., has been named vice president of International Lubricant Corp., of New Orleans. International Lubricant manufactures and compounds greases and lubricating oils. Mr. Symon has been a director of the corporation for several years. He was recently made general sales manager.

EUGENE D. SMITH has been appointed advertising manager for Lion Oil Co., a division of Monsanto Chemical Co., effective December 1. Assistant advertising manager since 1956, he replaces Clarence R. Olson, who will remain as consultant in matters pertaining to advertising and sales promotion.

FREDERICK E. MERLISS has been appointed manager of Cities Service Production and Exploration Research laboratory, Tulsa, Okla.; and **BERNARD H. ROSEN** becomes manager of the Cities Service Product Development laboratory at Cranbury, N. J.

WATT H. McBRAYER of Bartlesville, Okla., has been named manager of industrial relations for Cities Service Oil Co. (Delaware). He succeeds Fred M. Butler, transferred to the New York offices of the parent Cities Service Co. as assistant manager of industrial relations.

Mr. Butler was appointed manager of industrial relations in 1941. His election to the directorate of Cities Service Oil Co. (Del.) was announced earlier this year. Mr. McBrayer joined Cities Service Oil Co. in 1950 as a member of the legal division, assigned to industrial-relations work.

WILFRED M. KLUSS has been appointed assistant to the general manager of the marine transportation department of Socony Mobil Oil Co., New York. Previously he had served as senior area executive in the department of Middle Eastern affairs. He came to the company in 1954 from the International Bank for Reconstruction and Development.

CARSON R. SCHALL, chemical and petroleum market representative in Reynolds Metals Co.'s Dallas office, has been transferred to Maracaibo, Venezuela, as foreign sales representative. He joined Reynolds in 1953 at St. Louis, where he assisted in solving customers' technical problems in the lubrication field.

OIL... *in Western Venezuela*

Crude oil output in Venezuela, one of the world's leading producers, comes mainly from the western part of the country, in the Lake Maracaibo area, although fields in Eastern Venezuela contribute approximately a third of the total production.

Amongst the diversity of drilling equipment in service in this oil-producing area, Paxman diesels are doing a job of unfailing service driving draw-works, rotary tables, and slush pumps, both up country and on offshore rigs. These engines come from a range developed from 16,000,000 hours drilling experience, known by oil men everywhere for their sound performance, rugged construction and dogged dependability. Paxman engines for all oilfield duties are built in two power ranges. Engines having a common bore of 7 inches give you a power range of 100-1,000 b.h.p. In the 9¾ inch bore range of fabricated steel frames engines an output of 480-2,100 b.h.p. is available.

The Shell photograph above is of one of their drilling barges on Lake Maracaibo. Four Paxman sets provide power for the slush pumps and two more Paxman engines drive alternators for power and lighting.

The drawing at left is taken from a Shell photograph of a Cia. Shell de Venezuela deep drilling rig at La Paz field.

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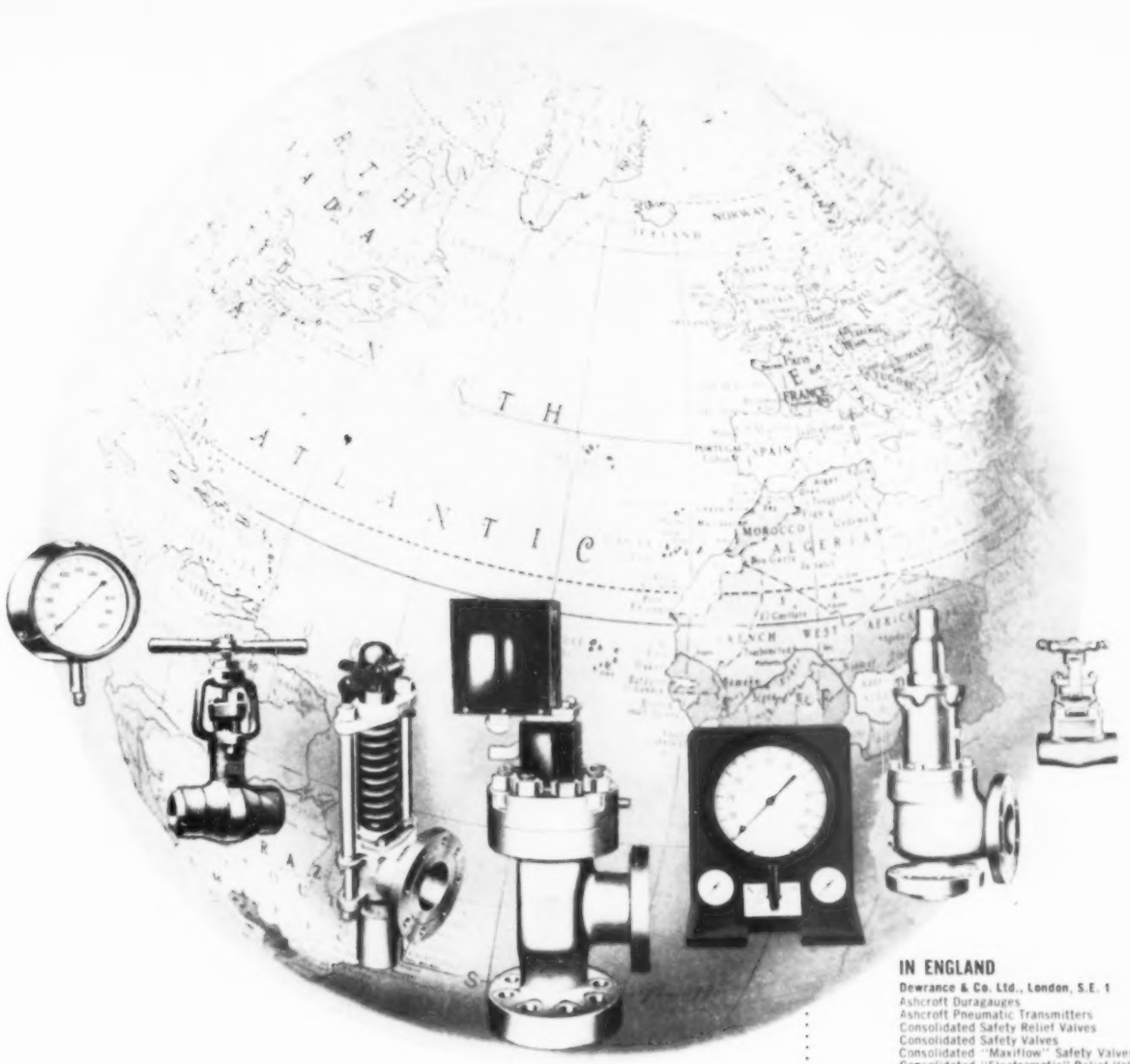

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High standards of quality and performance have long been responsible for the frequency with which our products are specified by the petroleum industry in the United States, Canada and Latin America.

Now the same efficient gauges, safety and safety relief valves, pneumatic transmitters, and steel valves are being produced in England, France, Belgium, Western Germany and Italy by companies well-known for precision manufacture. These licensees help to assure global availability of quality products bearing our brand names, *with payment acceptable in the currencies of those countries.*

Each of our licensees is unreservedly qualified to assist you in selecting the right types of industrial instruments and valves for your particular needs. We invite you to obtain from them specific product information for both new installations and facilities now in operation. Or write our Export Division.

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Ashcroft Duragauges
Ashcroft Pneumatic Transmitters
Consolidated Safety Relief Valves
Consolidated Safety Valves
Consolidated "Maxiflow" Safety Valves
Consolidated "Electromatic" Relief Valves
Hancock Steel Gate and Globe Valves
Microsen Electronic Process Controls

IN FRANCE

SAPAG, Paris
Consolidated Safety Valves
Consolidated Safety Relief Valves
Hancock Steel Gate and Globe Valves
Hancock Steel "Flocontrol" Valves
Microsen Electronic Process Controls

IN BELGIUM

Ateliers Jaspar, S.A., Liege
Consolidated Safety and Safety Relief Valves

IN WESTERN GERMANY

Deutsche Babcock & Wilcox Dampfkessel-Werke, Oberhausen (Rheinl)
Consolidated Safety Relief Valves
Consolidated Safety Valves
Consolidated "Maxiflow" Safety Valves
Consolidated "Electromatic" Relief Valves

IN ITALY

Societa Carraro & Co., Milan
Consolidated Safety Valves
Hancock Temperature Regulators
Filotecnica Salmoiraghi—SPA, Milan
Ashcroft Duragauges
Ashcroft Pneumatic Transmitters

IN CANADA

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Consolidated Safety and Safety Relief Valves
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J. D. McCONNELL, formerly vice president and director in charge of crude lines for Sinclair Pipe Line Co., has been appointed vice president and director in charge of the new economics and planning department. J. A. Jackman is executive assistant to Mr. McConnell.

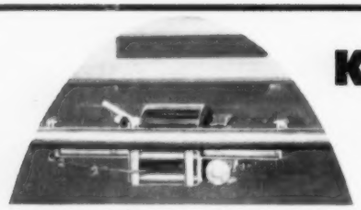
Sinclair's crude-oil and refined-products pipeline networks, each presently under the supervision of a vice president, will be placed under the central supervision of Lewis B. Moon, presently vice president in charge of products lines.

Mr. Moon will be directly assisted in the administration and supervision of the consolidated operations by L. C. Foy and G. H. Giles, general managers. Field operations will be supervised by Division Managers J. E. Lewis, Fort Worth; T. A. Myers and J. D. Maxey, Independence, Kans.; E. B. Jordan, Marion, Ohio; and C. R. Parish, Casper, Wyo.

JACK E. TRIGG has been appointed manager of the Rocky Mountain-Williston Basin division of King-Stevenson Oil Co., Chicago oil and gas exploration and development firm. Formerly vice president of Trigg-Drilling Co., Mr. Trigg will make his headquarters in newly-opened divisional offices in Denver.

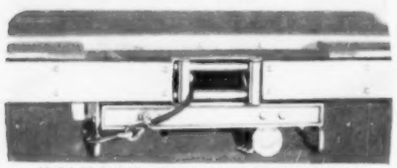
FORREST S. ELLEMAN has been appointed manager of The Pure Oil Co.'s general engineering department, succeeding W. Dean Kinsell who will serve as an engineering consultant and take charge of Pure's suburban office building project.

MERRILL J. ANDERSON has been promoted to chief automotive engineer in Ethyl Corp.'s Central Region in Chicago, Ill. He had been a member of the company's eastern region, with headquarters in New York.



Model A-11 King Winch on A-120 (4x4) all-wheel-drive International truck.*

CHEVROLET



Model CD-8116 King Winch on 1958 Chevrolet Model 31 (4x4).

Model 151J King Winch on Willys Jeep.

KING WINCHES

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COMPLETE, READY-TO-INSTALL KING FRONT-MOUNT WINCH ASSEMBLIES FEATURE:

- winch side arms to reinforce truck frame
- bronze-bushed, 4-way cable guide rollers
- cable drum guard
- heavy-duty pipe bumper
- needle-bearing, universal-joint spline-shaft drive assembly
- Timken bearings on worm

King Winches keep you moving through the most difficult terrain . . . you get action where there's no traction with dependable pulling power. King power winches have pulling capacities of 8,000 to 19,000 lbs.

* *King Winches for International trucks are available through International-Harvester dealers.*

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JERRY McAFEE, vice president, Gulf Oil Corp., Pittsburgh, has been elected 1959 vice president of the American Inst. of Chemical Engineers (AIChE). Mr. McAfee has been associated with Gulf Oil since 1945, when he was named chemical engineer in charge of pilot-plant operations.

C. TURNER HARDING, assistant manager of engineering coordination of Esso Research and Engineering Co., has been appointed chairman of the Security Committee of Standard Oil Co. He succeeds Donald L. Ferguson, who retires March 1, 1959, after a 38-year career with the Jersey Standard organization.

The Security Committee was organized in 1950, and is responsible for carrying out plans for assuring the continuity of company operations and preservation of vital records in case of disaster. Responsibilities include a remote-control center which is maintained outside metropolitan New York, used for storage of records, and is designed to provide a temporary operating headquarters for Jersey and its affiliate companies in the event an emergency made New York city offices inoperative.

T. M. CADY has been promoted to the newly created position of special representative in the exploration department of the southwestern region of Continental Oil Co., and **WADE E. THOMAS** will succeed Mr. Cady as southwestern region land superintendent—both in Houston, Texas.

PATRICK J. COLOMBO has been promoted to plans division supervisor, in the crude-oil coordination department of Standard Oil Co. (Indiana). He replaces Joseph J. Pope, who is joining the executive staff of Standard's new affiliate, Amoco Trading Corp., in New York.

GLENN W. POORMAN, an SONJ vice president, has been elected a vice president, director, and member of the executive committee of the Esso Export Corp. Esso Export engages in international supply and marketing operations of the Jersey Standard Group of companies. **THOMAS W. MOORE**, vice president of Esso Export, succeeds Mr. Poorman as a vice president and director of Esso Standard, principal domestic refining and marketing affiliate of the Jersey company.

W. W. CLAWSON has been named a senior vice president of Magnolia Petroleum Co., January 1. He will be responsible for all producing operations, including exploration, exploitation, research, and natural-gas departments. Mr. Clawson first joined Magnolia in 1933. In 1936 he was named assistant chief geologist, and in 1946 chief geologist. In 1953 he transferred to Socony-Vacuum Oil Co., and in 1956 was appointed coordinator of domestic production for Socony Mobil Oil Co. From this New York post, he transferred to Dallas in December 1957 as a director and vice president for Magnolia, Socony Mobil's southwestern affiliate.

J. A. LYNCH, formerly of Duncan, Okla., recently arrived in Kuwait to become production foreman for American Independent Oil Co. for a period of 18 months. Mr. Lynch arrived in the USA late last summer from Bogota, Colombia, where he had completed a two-year tour for The Texas Co. in the same capacity.

CHARLES T. EASLEY has been named resident manager of Delhi Australian Petroleum Ltd., which is conducting an exploration and drilling program jointly with Santos Ltd., in the Great Artesian Basin of Australia. **HORACE G. PULLIN** has been named drilling superintendent, and **A. R. GIBSON** will assist his as petroleum engineer.

JOHN M. KING has been named a director of the Independent Petroleum Assn. of America. Mr. King is president of King-Stevenson Corp., Chicago.

P. G. POLLARD, auditor for Sinclair Oil & Gas Co., who has served Sinclair companies for more than 39 years, has retired. Mark M. Shumard succeeds him.

VICTOR COTNER

Victor Cotner, a former vice president and director of Columbian Carbon Co., died at St. Petersburg, Fla., November 28, 1958, after a long illness. Mr. Cotner retired in April 1957. During most of his career he was employed by Columbian Carbon, and was chief geologist for many years.

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INTERNATIONAL NEWS AND NOTES

An artist's impression of BP's new German refinery, looking west (BP photo).

BP's New German Refinery

Ground clearance has started on the 600-acre site of BP's new 4,400,000-ton-per-year (100,000 b/d) German refinery near Dinslaken, 15 miles north of Duisburg, with completion set for autumn 1960. Crude will be received via the Wilhelmshaven-Ruhr pipeline now being constructed by a consortium of oil companies. Though BP already has two German refineries—at Hamburg with 2 million-ton-per-year capacity and a smaller plant of 220,000 tons—a complete new one was felt necessary as forward estimates of sales in the Ruhr, southern Germany, and parts of Switzerland indicate these should call for new capacity by 1962.

Main processing will be two 50,000 b/d crude distillation units. "Downstream" units will include a 12,500 b/d catalytic reformer, two 2,400 b/d copper-chloride treaters, and a 10,000 b/d Hydrofiner. The wide range of products to be made will include petrochemical feed stocks for new units building adjacent to the Bayer plant at Dortmund, to be operated by Erdölchemie GmbH, a company owned jointly by BP Benzin and Petroleum AG and Bayer. Products will be line blinded, and a large part distributed in Rhine barges. The refinery will be also connected by pipeline to a harbor being built 3 miles away at the junction of the Rhine and Lippe Seiten Canal.

American Oil Attache In Paris

Mr. Du Vivier, assistant commercial attache for petroleum affairs, has assumed his duties at the American Embassy in Paris. The post has been vacant for more than six months. Mr. Du Vivier's oil training was in Canada.

New SEG Libyan Affiliate

The increase and diffusion of geological knowledge and the promotion of fellowship and cooperation among geologists, geophysicists, paleontologists, petroleum engineers, and all those interested in petroleum, minerals, and water exploration are the objects of the Petroleum Exploration Socy. of Libya, latest among the growing family of world technical societies to affiliate with the Socy. of Exploration Geophysicists, according to announcement of Robert Dyk, secretary-treasurer of SEG, and chief geophysicist for Tidewater Oil Co., San Francisco. President of the Tripoli-based society is Donal M. West, Mobil Oil of Canada Ltd. Other officers include J. Allen Sawyer, Esso Standard (Libya) Inc., vice president; Jacques Canaple, Cie. des Pétroles Total (Libya), vice president; Daniel K. Hamilton, American Overseas Petroleum Ltd., secretary; Alex Stoupnitsky, Cie. Generale de Geophysique, treasuerer; Sam B. Frazier, Gulf Oil Co. of Libya, director; and Ronald C. MacLean, D'Arcy Exploration Co. (Africa) Ltd., director.

Hungary's Expansion Plans

Test-drilling footage is to be increased in 1959 to 935,085 ft from 826,812 ft. Crude production in 1960 is to rise to 1.21 million tons, 80% over 1957.

Of $76 million allocated for 1959 development of Hungarian chemical industry, $57 million has been earmarked for the petroleum industry.

Pipeline from Romanian gas fields to Hungary's Tiszapalkonya Chemical Works has been completed; 1959 deliveries will be 7,072 million cubic feet of gas.

East Germans Up Refining

Present throughput capacity of 200,000 tons per year of Mineraloelwerk Luetzkendorf gasoline and distillate plant in East Germany is to be raised to 700,000 tons by addition of a lube plant and an oil refinery. Construction has been going on for two years.

Russian Deliveries To East Germans

East Germany in 1957 received from the Soviets 1,044,500 tons of oil products worth $24,019,250 and 3,700 tons of lubes and fats worth $446,250; compared with 745,550 tons of products at $17,029,750 and 4,300 tons of lubes and fats at $383,500 in 1956. In 1956 Russian deliveries of oil-field equipment were worth $1,398,500.

USSR Underground Gas Storage

USSR's first underground storage reservoir for natural gas (capacity 35.3 million cubic feet) is in operation near Kuybyshev. A depleted gas field serves as reservoir. At present, 1.6 million cubic feet of gas are being pumped in daily through two bore holes.

USSR To Take On All Comers

According to leader of Russian delegation at recent 29-country UN Economic Commission conference meeting in New Delhi on Asian oil resources, USSR will cooperate with any country which seeks assistance in prospecting, exploiting, and processing of oil.

Sweden Reduces Product Prices

A new oil harbor at Kalmar on the east coast of Sweden has resulted in price reductions for oil products saving consumers $40,000 a year. Shell Oil Co., which has 18,500 cubic meters of tank capacity at the harbor, has lowered prices for gasoline, kerosine, heating oils, and other products. Other companies are matching the Shell reductions.

Iran Plans Fertilizer Plant

A contract has been signed between Montecatini and Sharif Emami Jafar, Minister of Industry and Mines of the Iranian government for the construction of that country's first nitrogen fertilizer plant near Shiraz. Cost of the plant, and the 140-mile pipeline which will be used to supply the natural gas used as raw material, is set at $30 million. Gas will come from consortium wells at Gashsaran.

Italian government's "portable island" on Mississippi River to New Orleans for first stopover in 10,000-mile voyage to the Persian Gulf. Top segments of electrically-powered legs are secured on deck, and will be added to existing legs upon arrival overseas. Oil-drilling derrick is stowed below deck. R. G. LeTourneau Inc., Longview, Texas, built the $1 million machine for SAIPEN, a subsidiary of Ente Nazionale Idrocarburi. Towing cost to Iran will be $100,000.

Nationalist China's first home-built oil tanker takes shape in the Ingalls-Taiwan shipyard in Keelung, Taiwan (Formosa); 1,700 Chinese, including engineers, and eight American consultants are rushing the 36,000-ton craft to completion for a 1959 launching. The $7,700,000 tanker is being built for General Tanker Corp., and it will sail under charter to Gulf Oil Co. It will bring crude from the Persian Gulf to the refinery of the Chinese Petroleum Corp., at Kaohsiung. This photo shows the steel frame work of the vessel. Keel for the 36,000-tonner was laid in March of 1958.

Soviet Aid For Romanian Chemicals

$2.9 billion to be spent in 1959 on metallurgical and chemical developments is 15% increase over 1958. Chemical industry's 20% share of total is twice that in 1958. Large credits have been promised by Russians.

New Yugoslavian Field

In northeastern Yugoslavia, the village of Janosik, near Alibunar in Banat area, has found country's fourth oil field. Prospecting is proceeding in the area at Bajsa and at Backa Topola.

Says USSR Equipment Unsurpassed

Jose Liceaga, Argentine trade-delegation head to Moscow, signed $100 million credit for delivery of Soviet oil-field equipment to Argentina. He said his country is now buying Soviet equipment surpassing American and European in quality—in some instances better than world standard; that seismic stations operate with 60 channels, instead of 24 or 30 as do others. Liceaga revealed Argentina will exchange technical information with Soviets.

Poland Plans Expansion

With Russian technical assistance, and to save imports of 63 million tons of oil products worth $2.6 billion, search for oil and refining is to be intensified in Poland. Exploratory drilling is to rise to 1,968,600 ft in 1975 from 328,100 ft in 1960. Prospective oil areas are estimated at 96,525 square miles in Carpathian region. Production in the region should rise to 29 million tons of crude and gas (35,310 cu ft of gas equal one metric ton of crude). Refining capacity is to rise nine million tons by 1975.

Aerial Gamma Radiometer

A gamma radiometer for high-speed aerial oil prospecting has been designed at the Oil Inst. of the USSR Academy of Sciences, Moscow. It can be used for surveying of a 386-square-mile area a day with an 80% accuracy in locating oil deposits. This instrument is to help in the prospecting of about 1,000 geological structures which, according to seismic, gravimetric, and aeromagnetic prospecting, are believed to be prospective oil areas.

Oil Believed In Siberia

On the basis of geological surveys conducted during the past few years, Soviet scientists believe a large oil-bearing area exists in the extreme northwest of the USSR, opposite Alaska. Most promising areas are said to be the Gulf of Anadyr, and the Gulf of Penshina on the northern shore of the Sea of Okhotsk.

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Kuwait Exports

Kuwait Oil Co. reports exports of crude oil in the first 10 months of 1958 at 383,483,376 bbl (1,228,564 b/d). Exports of other oils in the 10 months were: distillate, 4,919,261; diesel, 618,327; gas oil, 4,970,893; heavy fuel oil, 4,648,430; and light fuel oil, 1,089,190 bbl.

To Develop Syria

The United Arab Republic reportedly has decided to exploit oil resources of the Syrian region on a large scale. The Minister of Industry reportedly has agreed with others on construction of a 600-km pipeline to connect the Karatchuk fields with the Mediterranean and on building of a new refinery unit at Qamishli. The report estimated the pipeline would cost 99 million Syrian pounds, and the refinery about four million.

Taiwan Imports

Chinese Petroleum Corp. has concluded agreements to purchase 860,000 to 930,000 long tons of crude in 1959; compared with imports of 537,063 tons in first nine months 1958 (annual rate, 716,084). 1958 suppliers include Gulf Oil, Mid-East Crude Sales Ltd., and Mobil Overseas Oil.

Begin Work On Sahara Line

Construction of the Edjele-Zarsaitine pipeline from the Sahara to the Mediterranean will begin as a 24-in. line and one pumping station, with initial capacity of seven million metric tons per year (160,000 b/d). In final construction stage with four pumping stations, capacity will be raised to 13 million tons per year (260,000 b/d).

The ocean terminal is located at La Skhirra, 80 kilometers southwest of Spax, and 55 km north of Gabes. Two teams have been surveying the harbor at La Skhirra, of which a preliminary photographic survey had already been made. Most efficient use of harbor advantages will be determined by studies of comparative loading facilities.

TRAPSA, the French company in charge of pipeline construction, has under consideration bids from pipe manufacturers, and heavy construction equipment will be purchased in the USA. An agreement concluded by TRAPSA with the American pipeline constructors, Bechtel Corp., envisions completion of the line by October 1960, deadline for first tanker loading. Bechtel personnel are now in Tunisia. Final route of the line has been approved.

Algerian Well Tests Gas

Cie. des Pétroles d'Algérie (65% Dutch-Shell) is drilling Hamra No. 2, 400 kilometers south of Ouargla. Hamra No. 1 had some gas shows several months ago. Between 2,171 and 2,789 meters, Hamra No. 2 tested 150,000 cubic meters per day of wet gas. The well is located 263 km south of Hassi Messaoud and 385 km northwest of Edjele on the Hassi-el-Blod concession of Cie. des Pétroles d'Algérie.

Iranian Barter Deals

According to the Middle East correspondent for the *London Times*, one reason the Iraqi government is anxious to obtain some oil from IPC instead of taking all its oil royalties in cash is that barter deals of oil for manufactured goods are contemplated for the future. Trade agreements have been signed with Communist China, East Germany, Yugoslavia, and the UAR, and one is expected soon with India.

Lebanon Deliveries

Tapline crude deliveries from Sidon, Lebanon, in first 11 months of 1958 averaged 369,809 b/d compared with 343,950 b/d in same period of 1957. November 1958 deliveries averaged 378,731 b/d, compared with 339,485 b/d same month 1957.

Turkish Iranian Line

The Iranian prime minister has referred the Turkish-Iranian agreement for a pipeline from Iran to the Turkish Mediterranean to the Majlis. The agreement is reported to stipulate the line shall be used to take oil from the consortium's concession in southern Iran, if agreement is reached. This is interpreted to mean NIOC wishes to implement pipeline project even before it starts producing oil at Qum. The advantage to Turkey is the provision that it may buy 10% of oil passing through the line in Turkish currency at 6% discount.

Arab Tanker Fleet

A spokesman for the Arab League Permanent Petroleum Bureau said in Baghdad that Kuwait and Qatar both support the plan for establishment of an Arab oil tanker fleet.

Jordan Pipeline

A Jordan Refinery Co. spokesman has announced contact was about to be let for a 50-km 8-in. pipeline to carry crude from Tapline to refinery site near Sarqa. Italian constructers of the refinery say parts of the plant will begin reaching Jordan in February 1959.

Egyptian Tankers

United Egyptian Maritime Transport Co. is to raise UAR flag over two oil tankers. The first, a 12,000-tonner, now carries crude from Ras Gharib to Shell refinery at Suez; second, an 11,000-tonner, carries crude from Wadi Fairan to government refinery at Suez.

Egypt's Expanded Oil

Egypt's Five-Year Industrialization Program contemplates for oil (1) expanded production to fill local needs and some exports; (2) increase by one million tons per year of refining capacity at Suez and Alexandria (combined current, three million tons); (3) 16 million Egyptian pounds budget for petrochemical and lube plants and increased butagas output; (4) new and expanded oil storage; (5) laying of pipeline links to refining and storage centers, and purchase of two new 20,000-ton tankers to bring Egypt's fleet to four.

Persian Gulf Test

Early in December, the Japanese Arabia Oil Co. announced in Tokyo that its first Persian Gulf well will be sunk next April in the offshore area of Saudi Arabia-Kuwait Neutral Zone. Contract for well drilling was signed at The Hague with International Drilling Co. Arabia company said it will need $12.5 million for operations in 1959. Japan Export-Import Bank tentatively is willing to extend $2 million credit and encourage other commercial banks to extend loans for company's project.

Iranian Gas Contract

The Shah of Iran recently was visiting northern Italy's refineries. According to the Beirut press, in addition to Agip Mineraria's concession signed in 1957, "Agipgas" was about to sign with Iranian authorities for creation of Italian-Iranian company to supply Tehran with gas.

Iranian Terminal

NIOC will invite bids for setting up of new loading terminal for products of Abadan refinery—including 25-mile pipeline from Abadan to Qur Mussa, six miles west of port of Shapur. About 16 million tons per year of products will be loaded in new terminal, construction to start in 1959. The port will be able to handle up to 16,000-ton tankers; 100 storage tanks with capacity of six million tons of refined products will be built.

Israel Pipeline

Israel government spokesman reported $22.4 million 6-in. 50-mile 12,000 b/d pipeline from Haifa to Tel Aviv was to be in operation in December 1958.

French Equatorial Africa

Mobil Oil Française and Mobil Exploration West Africa have concluded an agreement with SPAEF (French firm) for joint exploration and development in the Gabon and Middle Congo. Costs will be divided 50% by SPAEF and 25% each by the two Socony affiliates. Agreement is subject to government approval.

New Zealand Wildcat

Shell-BP and Todd Industries will spud an early 10,000-ft wildcat on a 5,574-square-mile license area on the west coast of North Island, New Zealand. Exploration expense on four-year concession, which has one year to go, is budgeted at $2.8 million.

USSR Equipment For Syria

Egyptian press reports arrival of Soviet oil drilling equipment in Syria. Shipment included turbodrills.

Syrian Drilling

Test drilling at Karachuk in al-Jazirah district of Syria has been resumed. This is completion of work begun by Menhall before cancellation of its contract.

Jordan Refinery Planned

An Italian firm has mapped Jordan's first refinery for 1960 completion. The $9.8 million 7,000 b/d plant, 15 miles north of Amman, will be linked by a 25-mile $1,100,000 pipeline with Tapline to bring crude from Saudi Arabia.

Soviets To Help India

Oil products and drilling equipment will be sent by Soviets to India under five-year trade pact; payments to be in rupees.

Germans In Libya

The German firm Deutsche Erdoel has obtained 9.8-million-acre concession in the Fezzan area of Libya.

French-Sonj In Sahara

Government approval is sought for joint 50-50 exploration by Standard of New Jersey and Cie. Française des Pétroles in the Sahara's 7,720-square-mile Erg Oriental area along Tunisian border, for which CFP has had application pending since 1956. SONJ would be operator.

Seeks Papuan Rights

Camelot Nominees Pty. Ltd. (owned 50% by Murphy Corp.) has applied for rights on 9,500 square miles Australian part of New Guinea. New Guinea Gold and Petroleum Development Co. has applied for 1,650 square miles near Dutch New Guinea border, where earlier in 1958 it had surrendered a license.

French Carbon-Black Plant

An oil-black plant will be constructed in France, according to joint announcement by K. S. Adams, chairman of Phillips Petroleum Co., and Robert I. Wishnick, president of Continental Carbon Co. The two companies are forming an equally owned French company to build and operate the plant, whose initial capacity will be 56 million pounds annually of the oil-black types now used generally by the rubber industry. Engineering and design work is nearing completion, but location of the plant has not yet been finally decided.

Pan Am In Persian Gulf

Pan American International's first offshore test in Persian Gulf will be spudded by midyear 1959; to go to 16,000 ft. Seacat Drilling Co. is slated for drilling contract.

Russian Production

During first nine months of 1958, USSR production was 84 million tons (1,680,000 b/d), 16% over same 1957 period.

Drill-Speed Record

Assam Oil Co. drillers at Nahorkatiya, Upper Assam, India, recently achieved 6 ft less than the world record of drilling speed. The world record is believed to be 2,305 ft of drilling in an eight-hour shift set up at a well in the USA Los Angeles basin. The ACC drillers penetrated 2,299 ft in a similar

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shift. They also broke their previous record of the subcontinent—1,708 ft in 8 hours, set up at well No. 35 at Nahorkatiya in August 1958.

Assam's well No. 37, spudded in November 7, reached 6,226 ft, and was drilling ahead. Well No. 36, completed earlier at a depth of 10,293 ft, proved a successful producer.

Iran Gas Distribution

The Agipgas (ENI affiliate for distribution and sale of gas), after signature of an agreement with the Teheran authorities, will succeed the Iranian companies now distributing gas for domestic use in the capital of Iran. Agreement provides establishment of an Italian-Iranian company which will take care of the transport of natural gas from Abadan to Teheran, and distribution in town. Transportation will be by the existing products pipeline Abadan-Teheran, now operating only 80 or 90 days per year. The Agipgas technical staff asserts that, by changing the operating pressure and bringing out some technical modification to the pipeline, it can be employed also for gas transport.

Russia's Ambitious 7-Year Plan

Russia's 1959-65 Seven-Year Plan budgets $42.5 to $43.2 billion for oil and gas industry—2.3 to 2.4 times over previous seven years. $25.0 to $26.2 billion for chemical industry probably will be raised due to planned increase of artificial fertilizers. Primary distillation capacity is to be upped 2.1 to 2.2 times; catalytic cracking 4.3 times; catalytic reforming 16 to 18 times; lube oils to be doubled.

Share of oil and gas in USSR total fuel balance under 1959-65 Seven-Year Plan is to increase to 51% from 31%; geological drilling to rise 65%; oil pipeline network to be trebled; gas pipelines to have 16,146-mile addition. Oil output is to rise to 230 million to 240 million tons, and gas to 150 billion cubic meters by end of plan period.

Republic of Ukraine is to raise her crude output in 1965 to six million tons and gas to 31.5 billion cubic meters under the plan—with three new oil refineries. Azerbaijan's crude output is to rise 33%, gas production 160%, oil-field equipment 71%. Uzbekistan is to complete a new refinery. Turkmenistan's crude production is to be upped 80%, gas output 330%.

The plan also provides for several oil refineries to be built near USSR consuming centers. By 1959, entire river fleet is to be oil-fired, raising its efficiency 8%.

Italian Gas-Tax Cut

During the 1956 Suez crisis, the Italian government put a tax on gasoline of 14 lire (more than 2¢) per liter. On November 1, 1958, the government halved the tax, and asked the parliament to make the remaining amount—7 lire per liter—a permanent tax for integrating the funds planned for a national road-building plan. Opposition (including leftist and rightist) won against the tax, which was to be abolished at midnight, December 31. However, the standard gasoline without the Suez overcharge will still be high—128 lire per liter, equal to 91¢ per gal, because the price includes about 93 lire of other taxes.

USSR Electric Drilling

The Electrical Engineering Works in Kharkov, USSR, reportedly has developed an electric bottom-hole motor for the drilling of bore holes with a depth of up to 14,770 ft. The 100-kw motor is 32.8 ft long, but only 6.7 in. in diameter. Its interior is filled with oil to cool and lubricate the shaft which operates at 1,000 rpm.

As the electric drill operates without drill pipe, the drilling mud is kept in circulation by a centrifugal pump in the motor. Trips can be made many times faster than in a conventionally drilled bore hole.

New Saharan Oil Law

Following is a declaration of M. Max Lejuene,* Minister of the Sahara, on the new Saharan petroleum law:

"There is enough evidence today to support the belief that the Sahara is one of the big oil provinces of the world. We are confident that this great desert, the largest in the world, is at present the best chance of Europe and the Free World in the matter of energetic resources, which are vital to their economic life and future.

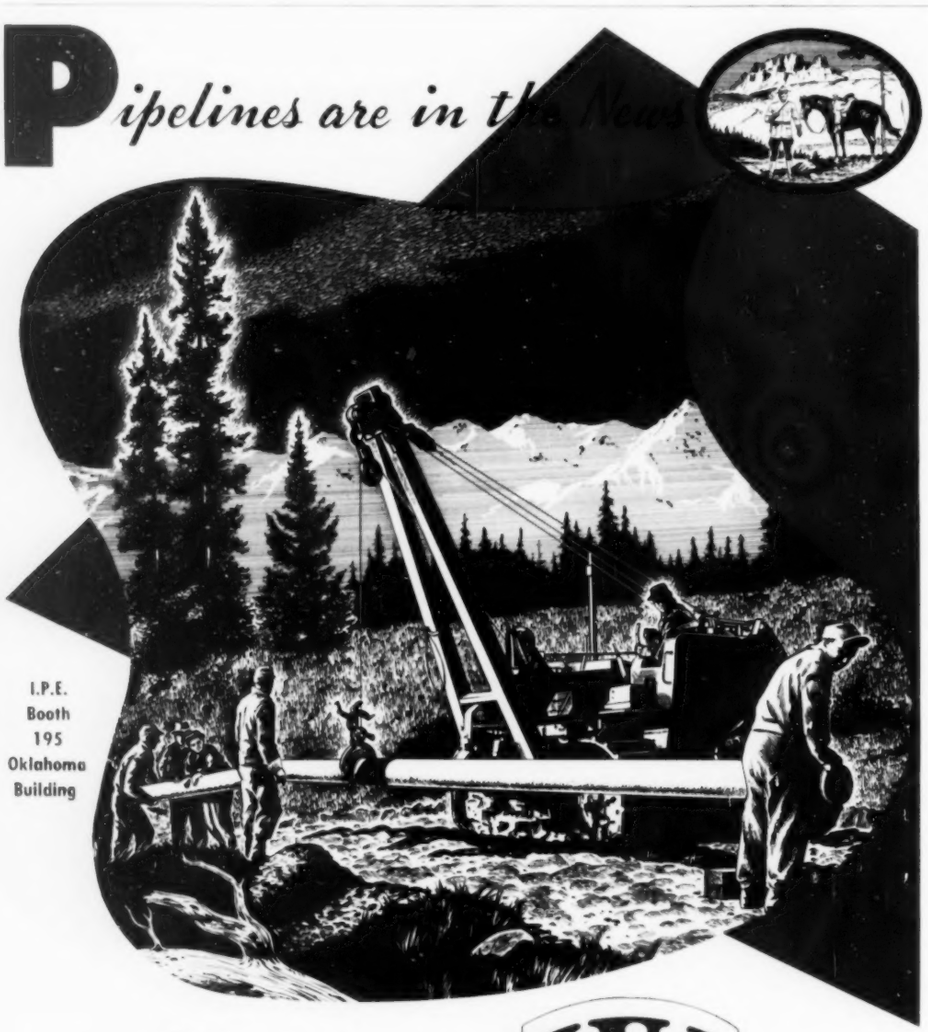
"French enterprise, later joined by foreign enterprise, has already done a good piece of work in the Sahara. But there is still much to be done.

"In enacting the *Petroleum Code of the OCRS* (Common Organization for Saharan Regions), the French government wishes to give a new incentive to the research and the exploitation of oil and other hydrocarbons in the French Sahara. With this goal in mind, the existing laws have been completed and unified, in order to give a network of legal guarantees to new capital, both French and foreign. And as an example, by taking long-term commitments towards foreign enterprise in the field of fiscal system, France felt it in favor of the development of this immense Sahara, for the common interest of our world and our civilization.

"My country, very naturally, is willing to ensure its normal supply of petroleum products to the whole French monetary zone. But at the same time, I wish to stress that France is not interested in the financial resources from oil, which will be attributed to the welfare of the local people.

"The French government has now produced the complete legal framework for the exploitation on a large scale of the Saharan oil wealth by international cooperation. It is our hope that men and capital from friendly countries, and especially from the United States, will endeavor to participate, together with French men and capital, to this great achievement for the common benefit of the whole western world."

* M. Max Lejeune, aged 47, has been Minister of the Sahara since its creation about 1½ years ago. He was re-elected to the National Assembly, on the first ballot, November 23, 1958.



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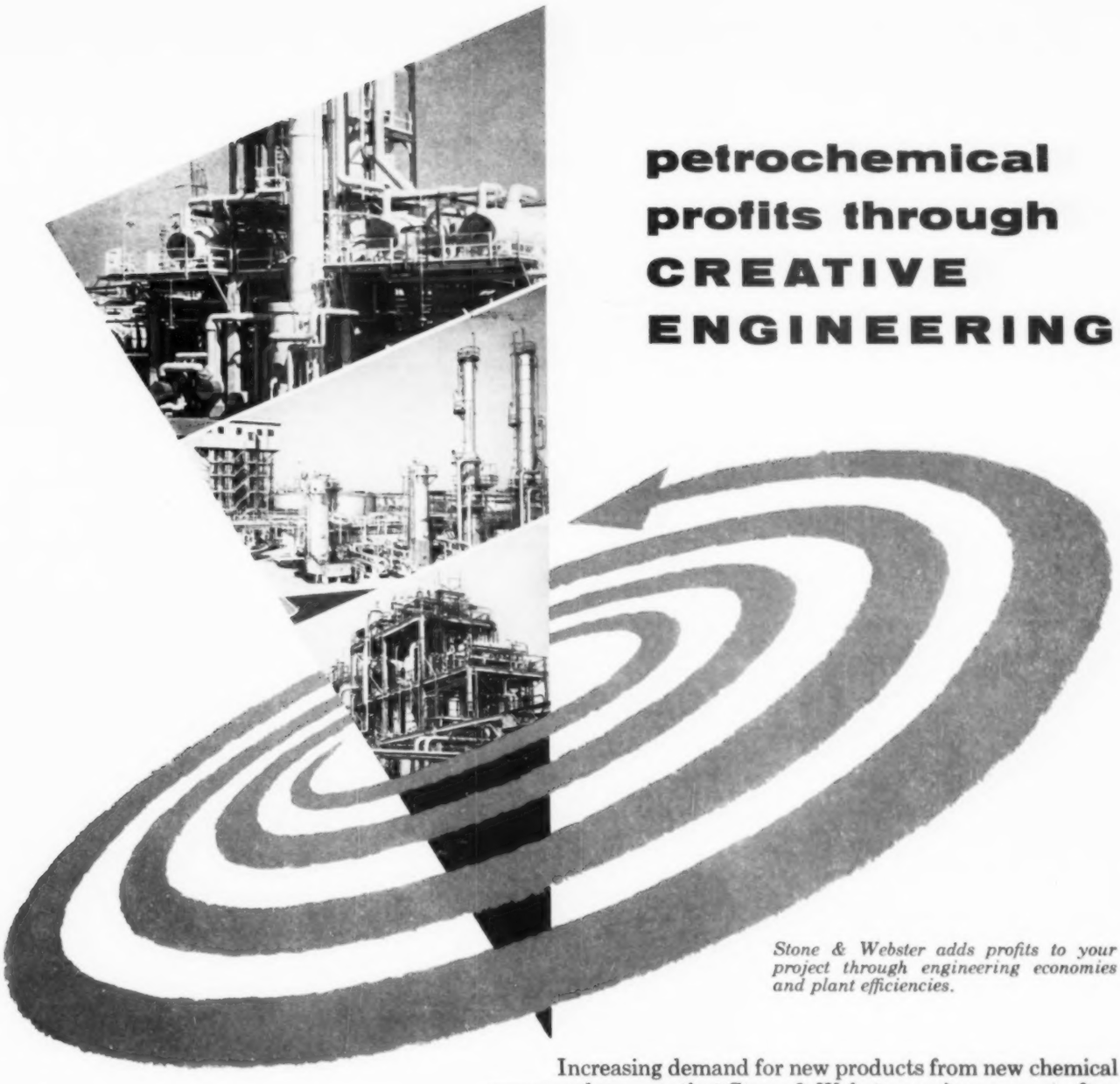

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Stanvac's Somaliland Test

Stanvac has spudded its pioneer African wildcat in Somaliland Protectorate, Dagah Shabell No. 1, 50 miles south of Berbera on Gulf of Aden.

Israel Refinery Sold

BP-Shell have sold their large Haifa refinery, for an undisclosed amount, to Iwol Investments, of which Isaac Wolfson is chairman.

UAR Syrian Pipeline

Cairo press reports UAR authorities were discussing plans for the construction of a pipeline to bring crude from Karachok to Homs refinery.

Dresser Italian Affiliate

Dresser Industries Inc. is to establish an Italian affiliate, to be known as Dresser of Italy, to expand existing activity in the Italian market. The new company will replace Clark of Italy. Capital of the new enterprise is around 50 million lire, supplied by Dresser AG, Zurich, which obtained authorization from the Italian treasury to invest in the Italian associate 400,000 Swiss francs. Probable director of Dresser of Italy will be Mr. MacLellan. Head office of the company will be in Milan, Via Manzoni 5.

Soviet-Bloc Line

According to Czech radio, Soviet bloc's Council for Mutural Economic Aid (Comecon) has approved building of pipeline from Russia to four East European satellites—Poland, East Germany, Czechoslovakia, and Hungary.

Mozambique Refinery

According to Manuel Queiros Pereira, one of the Portuguese backers, the new 10,000 b/d oil refinery of Soeda. Nacional de Rafincao de Petroleos now building in Mozambique, will be completed before its two-year official deadline.

Sahara Extensions

Minister of Sahara has extended for two years and 11 months the five oil exploration permits of Cie. d'Exploration Pétroliers (State-controlled company in the Sahara).

Queensland Applications

Oil-search leases have been taken out or are being sought over all but 115,000 square miles of Queensland's 670,500-square-mile area. Additional leases have been granted over more than 110,000 square miles offshore along Great Barrier Reef and in Gulf of Carpentaria. Plymouth Oil of Texas has applied for 45,900 square miles on Cape York peninsula. Another company (not named) seeks a lease over 57,900 square miles on Hughenden.

CFP Sahara Exploration

The State-owned Ste. Nationale de Financement de Réchèrches de Pétrole (SONAFREP) has been set up to concentrate all financial holdings of the government's exploration bureau. TOTALREX was formed by French petroleum distributors of the major oil refining company, Cie. Française de Raffinage (subsidiary of Cie Française des Pétroles). It plans participation in the financing of CFP exploration in the Sahara.

100,000-Tonner In Japan

World's first 100,000-ton tanker, "Universe Apollo," was launched in Kure, Japan; builders, National Bulk Carriers (American).

Middle East Plan Off

OEEC has shelved its elaborate plan of storage preparation for any new Middle East oil shutdown—because of impracticability of raising so large a fund as $500 million to $600 million and because oil and tankers are now more available than after Suez shutdown. Alternate plan is being studied.

World Petroleum Market Trends

(Continued from page 51)

portunities for marketing their oil, and either would have reduced the area over which sales could be made or, alternatively, required substantial discounts from posted crude-oil prices. The Soviet Union has also found it possible to charter a much larger supply of tonnage at relatively low rates than it could have expected to acquire in a period when tanker vessels were not in oversupply.

As a consequence of the decline in rates and the drive of certain companies to acquire market outlets, delivered oil prices in many important markets have fallen to the lowest levels in several years. One recent contract involving the sale of substantial quantities of Lake Maracaibo crude to Brazil was negotiated at prices which reflected a discount of 20¢ or more from Venezuelan posted prices. And foreign crude oil is being imported into the USA East Coast at 50¢ to 75¢ per barrel below the delivered price of comparable Texas crudes moved from the USA Gulf to Atlantic seaboard refineries.

Looking to the immediate future, it would appear that the world oil industry confronts a period of continued intense competition for market outlets. Although the amount of tanker tonnage in lay-up is now lower than it was in the summer of 1958, it still is greater than four million deadweight tons. So long as excess tonnage remains near this figure, no major improvement in rates can be expected. An important question exists as to what will happen to delivered oil prices and the marketing operations of the newcomer-companies once tanker tonnage does become tight and rates do firm. No definite answer can be given now. However, considering the heavy capital outlays these firms have made on new concessions, the desire to earn a return on their investment can be nothing but a great one. For this reason, it seems likely that they will continue to occupy a role in international oil marketing. END

Irish Sea Tow

A 50-ton refinery pressure vessel, 120 ft long and 13 ft in diameter, was recently towed successfully across the Irish Sea from Birkenhead to Cork for the Whitegate plant of Irish Refining Co. Ltd., taking 2½ days on the journey. Made at the Stockton works at Ashmore, Benson, Pease and Co., in terms of sheer bulk it is the biggest single piece of equipment to make this journey so far. To insure the cylinder's stability, a cradle was made of special bogies fitted with large balloon tires, and air was maintained under pressure inside the cylinder. Gauges linked to navigation lights astride the cylinder showed the tug master that pressure was being maintained.

Scottish Petrochemicals Plant

Stone & Webster Engineering Ltd., in London, has been selected to design and construct a new major project for British Hydrocarbon Chemicals Ltd. British Hydrocarbon is the joint undertaking of The British Petroleum Co. Ltd. and The Distillers Co. Ltd. Capacity for the production of olefins for the manufacture of petroleum chemicals by British Hydrocarbon will be more than doubled by the installation of a third ethylene plant at Grangemouth, Scotland, scheduled to be completed by the middle of 1960.

The new plant will be the largest of its kind outside of the USA, and will be considerably bigger than any other such plant so far built in Europe. Of the 13 plants in British Hydrocarbon's modern petrochemical complex at Grangemouth, this is the tenth designed and constructed by the Stone & Webster organization.

Turbo-Fuel Quality Control

"The Control and Measurement of Cleanliness Quality in Turbo Fuel" is an 8-page report by C. E. Loeser, of Esso Research & Engineering Co.; and D. D. Love and A. R. Ogston, of Esso Export Corp.; reprinted from September-October 1958 issue of *Esso Air World*.

Platformer Onstream

American Petrofina's Platformer at its El Dorado, Kans., refinery has been placed onstream. Construction of the unit was recently completed by Petrofina's local engineering and labor force.

Perkin Medal To Houdry

Eugene J. Houdry, for his contributions to the catalytic cracking of petroleum, is the 1959 recipient of the Perkin Medal annually awarded by the Society of the Chemical Industry. An outstanding authority on catalysis, Mr. Houdry founded the Houdry Process Corp., and most recently organized Oxy-Catalyst Inc.

R. E. Nelson

E. J. Houdry

New International Marketer

A new company which will buy, sell, trade, and transport crude oil and petroleum products on an international scale has been formed as a subsidiary of Standard Oil Co. (Indiana), according to announcement by chairman Frank O. Prior and president John E. Swearingen. The company is named Amoco Trading Corp.; and its president, effective January 1, is Richard E. Nelson, Jr., formerly director of operations in Standard's supply and transportation department, Chicago. Offices of the new company, opened January 2, are at 630 Fifth Avenue, New York, N. Y. Other offices abroad will be opened later.

Technical Translations

The Department of Commerce has begun publication of a periodical planned to serve as a central source of information in the United States on Russian and other technical translations available to science and industry. The periodical, *Technical Translations*, will be published twice a month by the Office of Technical Services, in cooperation with the Special Libraries Assn. It will list and abstract translated material available from USA government sources, SLA, cooperating foreign governments, educational institutions, and private sources. As part of the cooperative arrangement between OTS and the Special Libraries Assn., SLA's *Translation Monthly* will be incorporated in *Technical Translations*.

Technical Translations will be sold by OTS at $12 a year ($4 additional for foreign mailing); single copy is 60 cents. Orders should be addressed to OTS, US Department of Commerce, Washington 25, D.C.

Urges Middle East Program

In a recent address before the Foreign Trade Convention in New York, Marcel E. Wagner, president of American Eastern Corp., a long-established shipping, trading, and development company in the Middle East, gave his solution to the problems in the Middle East which face the free world. Drawing on his experience of 30 years and a recent two-hour visit with President Nasser of the United Arab Republic, Mr. Wagner urged a program be put into high gear which would:

First—respect the natural aspirations of the Arab countries of the Near East for positive neutrality.

Second—help them to prevent mass starvation by selling to them (not giving to them) at favorable terms, some of the USA surpluses—taking local currencies in payment.

Third—make available to them, again at favorable terms, essential equipment for basic industries and irrigation—for the production of food and shelter and to give millions gainful employment and sustenance.

Fourth—give American business which has successfully proven Near Eastern know-how—the necessary encouragement to take risks in that area; risks which are not necessarily consistent with good American business standards.

Fifth—encourage the Arab Development Institution suggested by President Eisenhower—which will help the Arabs to help themselves.

Sixth—the last but not the least—the USA must not shy away from the possible high cost of carrying out some or all of the above recommendations, which have in part been made many times before.

Aluminum Fire Protection

Oil-company representatives, with responsibility for fire services and protection in refineries, installations and safety in tankers, witnessed a striking demonstration recently, presented jointly by James North Export Ltd. and Fire Armour Ltd., of the efficiency of FYRE ARMOR aluminized heat-reflective fire-entry rescue and proximity fire-fighting suits. The key to the efficiency of the bonding of special aluminum foil to flameproof textile-base fabrics is by a patented process in conjunction with an inter layer of aluminum bronze. This type of material is employed in double thickness for the fire-entry rescue suits, whereas the proximity fire-fighting suits employ a special process of aluminizing a plastic foil, which is then bonded to its particular type of base fabric. The suits were demonstratively pliable and easily donned: A rescue suit including helmet and visor weighs only 14 lb and a proximity suit 7 lb. Minimum heat reflection of 90% in all temperatures is claimed, with the temperature inside the rescue suits maintained at about 97 F despite external temperatures up to 2,500 F. Several oil-company visitors donned the rescue suits themselves after the official demonstration, and they tested them by walking around the rim of a pit containing blazing oil where the temperature was around 1,000 F and no undue discomfort from heat was found.

Marine Safety Device

When tankers of the Socony Mobil Oil Co. fleet blow their whistles at night, passing vessels will be able to see as well as hear the signals. The Marr visible signal—a light synchronized with the vessel's whistle—recently completed successful tests aboard the tanker, "Mobil Fuel," the first ocean-going ship to install it. The light proved so effective that the oil company has ordered it installed on 12 of its tankers.

When the whistle-sounding mechanism is pulled, the device projects light rays in every direction—vertically, horizontally, and at a 45-deg angle visible all around the horizon. The amber glow can be distinguished from any other light, afloat or ashore. It can be seen seven miles in clear weather.

Ten past presidents of the Los Angeles Chapter of NOMADS attended the December 10, 1958 meeting. From right to left (going down the table) they were: Elmer Decker, Martin-Decker Corp., first president of the organization, 1939; Ted Sutter, Baker Oil Tools, 1940; Henry Pullman, Baker Oil Tools, 1943; Roland Smith, Roland E. Smith Co., 1944; Lee Laird, Landish Pacific Division, 1949; Earle Boggess, Baker Oil Tools, 1950; Bill Wilson, Web Wilson Oil Tool, 1952; John Flanagan, Johnston Testers, 1954; Harry Hester, McCullough Tool Co., 1956; Bob Gaylord, Wagner-Morehouse, 1957.

Foreign Trade Center

A permanent oil-field equipment display has been incorporated in Houston's new Foreign Trade Center at 201 Roberts. The new center has devoted 46,000 sq ft of exhibit space to the petroleum and industrial display. The permanent trade fair will be handled by multi-lingual attendants. Visitors will be provided with multi-lingual secretarial and interpreting services. A private club is being opened in connection.

IOCC 1959 Officers

Governor J. Hugo Aronson, of Montana, has been elected chairman of the Interstate Oil Compact Commission for 1959. He succeeds Governor Milward L. Simpson, of Wyoming. Z. Arthur Nevins, of Topeka, Kans., was elected first vice chairman, succeeding Jake Jacobsen, of Austin, Texas; and Dr. Wilson M. Laird, state geologist for North Dakota, was elected second vice chairman, succeeding James C. Hemill, of Oklahoma City. Lawrence R. Alley, of Oklahoma City, was named executive secretary; and Earl Foster, also of Oklahoma City, was elected general counsel.

CATC New Offshore Field

Discovery of a new oil and gas field in the Gulf of Mexico some 40 miles off the Louisiana coast has been announced by Continental Oil Co., operator for the CATC group. In addition to Conoco, other members of the CATC group are Atlantic Refining, Tidewater, and Cities Service. The discovery well, the Ship Shoal Block 199 No. A-1, Terrebonne parish, already has logged multiple gas pays and one probable oil pay in sands in depths between 5,000 ft and 10,000 ft. Projected total depth of the well is 14,000 ft.

The CATC group has two blocks totaling 10,000 acres in the area. Nearest production is 1½ miles north of the discovery well.

Pipeline Control

Southwestern Industrial Electronics Co., Houston, has published a handsome hard-cover book under the title "*Control . . . the answer to increased pipeline profits.*" Automatic remote-control systems for both liquid and gas lines are described, and information given as to why such systems are necessary in cost-reduction programs on a modern pipeline system. Data are given on computer applications, including analog to digital converters.

JOHN J. ROWAN has been appointed manager of the Montreal East refinery of Imperial Oil Ltd. He succeeds Dr. J. L. Huggett, retired. Mr. Rowan joined Imperial in 1936 in the engineering department at Sarnia. He has been assistant manager of Montreal for the past five years. Dr. Huggett first joined Imperial in 1914. After his war service and a period of study at Canadian and foreign universities, he rejoined the company in 1929. He has served as manager of both Sarnia and Montreal plants.

J. J. Rowan

R. R. Newton

Ryder Scott Management

Ryder Scott Co., petroleum engineers of Wichita Falls, Texas, has announced formation of the Ryder Scott Management Co. for professional management and operation of oil properties. The new company is headed by Richard R. Newton, president and general manager, with offices in Wichita Falls.

Mr. Newton, a petroleum engineer, has had 12 years' experience in petroleum production. As an engineer and corporate officer for the Smith Newton Oil Co., he assisted in the management, operation, and development of water-flood properties. Prior to this, he worked for Continental Oil Co. in Texas, Louisiana, and Oklahoma.

Radioactive Reserves Increased

Radioactive ore reserves in the United States have been increased to an estimated 80 million tons by applying gamma-ray logging to the search. Frank Stead, chief of uranium research & resources, U.S. Geological Survey, has revealed that of this total approximately 50 million tons were located using radiometric assays by means of gamma-ray logs.

The new search techniques were discussed with members of the Atomic Energy Commission and 12 different major uranium-producing companies at a recent conference in Grants, New Mex. Speakers were provided by Century Geophysical Corp., Tulsa, which has logged over 15 million feet of test holes drilled exclusively for uranium exploration in the past four years. The company has 13 logging units in the field.

Oil-Shale Publication

Report of Investigations 5429: "Oil-Shale Mine, Rifle, Colo., A Review of Design Factors," can be obtained from the Bureau of Mines, Publications—Distribution Section, 4800 Forbes Ave., Pittsburgh 13, Pa. It should be identified by number and title.

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Magcobar European Appointment

Peter W. Cooke, recently appointed manager of the newly created Magcobar Division of Dresser (Great Britain) Ltd., will be responsible for that company's activities in Europe and the Middle East. With Mr. Cooke's appointment, Magnet Cove Barium Corp., or Magcobar as it is known in the oil industry, will have available both sales and technical assistance on drilling-mud programs in Europe and the Middle East.

J. L. Tullis

P. W. Cooke

Beaird Names Tullis

John L. Tullis has been elevated to president and general manager of The J. B. Beaird Co. Inc. He succeeds J. Pat Beaird, son of the company's founder and president since 1939, who announced his resignation effective December 31, 1958. Mr. Beaird will remain as a director of the Beaird Co. and a member of the board of American Machine & Foundry Co.

Equipment Congress In Paris

The Federation of European Petroleum Equipment Manufacturers (FEPEM) will hold its Third European Petroleum Equipment Congress from June 22 to 25 in Paris, at the Maison de la Chimie. It will be under the general direction of Mons. R. Navarre, chairman fo the Institut Français du Pétrole, and will be run concurrently with the International Convention of Chemical Engineers.

The first three days of the congress will be devoted to the presentation and discussion of 20 papers under the following three sections: (a) safety in refinery operations; (b) transport and distribution of petroleum products; and (c) drilling techniques and equipment. The papers are selected to cover authoritative views from the leading European countries. The fourth day is reserved for visiting the Chemical Engineering Exhibition, refineries, and other centers of oil interest. A special program is being arranged for the ladies. Full details can be obtained from the organizing secretary, Mons. J. P. Le Gall, FEPEM, 44 bis, Rue Pasquier, Paris 8. In the United Kingdom, the Council of British Manufacturers of Petroleum Equipment (2 Princes Row, London, S.W.1.) will be glad to send information.

Resilient Sealing Valve

A new resilient seal valve has been developed by Harrisburg Inc. The valve's positive sealing action is accomplished with a newly-designed totally-confined resilient *U*-shaped insert. When the valve is closed, resilient Buna-N synthetic rubber molded to the wedge gate fits into the arms of the insert, applying equal pressure to all sealing points.

Dresser Foreign Operations VP

Lars H. Nordenson has been appointed new vice president in charge of foreign operations for Dresser Industries Inc. J. B. O'Connor, Dresser president, announced the appointment after a globe-circling business tour and reaffirming the company's interest in foreign markets.

Mr. Nordenson's previous affiliations have included Liljeholmens Stearinfabrikis AB in Stockholm, Sweden, as assistant to president; sales manager for M. W. Kellogg in London and Paris; American Cyanamid, and Union Oil of California. For the latter two firms he was engineering executive. A native of Sweden, Mr. Nordenson was educated in Stockholm, Paris, and the USA, where he received his chemical engineering degree from MIT.

Mr. Nordenson will locate at Dresser's headquarters in Dallas, Texas.

Serge Sylvian (left), chief engineer for the Entrepose Co.'s Iran division, inspects a set of Cross Trac-Wheels with the Tulsa manufacturers' vice president—sales manager John Behrenfeld (right). In center is Crose export sales manager John Manley. Newest item in the Crose line of pipeline construction equipment, Trac-Wheels are being extensively used on pipe-coating kettles and bending machines.

Engineer Visits Crose

A top-ranking representative of Western Europe's largest pipeline construction and engineering firm, the Entrepose Co., Paris, recently completed a lengthy visit at M. J. Crose Manufacturing Co. Inc., in Tulsa, Okla.

Serge Sylvian, chief engineer for the Entrepose division operating out of Teheran, Iran, was the Crose visitor. He has been making a three-months tour of pipeline construction projects and operating installations in the United States, Crose was included in his statewide tour because the Tulsa firm's equipment is extensively used in Entrepose's construction activities in several countries.

Entrepose has been active in Africa for over two years, and currently is constructing a 450-mile 24-in. crude line in the Sahara desert. Several months ago, a Crose pipe double-jointing unit, for completely automatic welding of large-diameter pipe in the field, arrived in the desert for the Entrepose project. It is the only such unit operating outside the United States.

Closed-Circuit TV Cameras

A new line of automatic closed-circuit television cameras, which will automatically adjust to changing light levels, has been announced by General Electric for unattended commercial uses.

Joins Swiss Firm

The appointment of A. Durukal as chief sales engineer for Petroleum & Mining Equipment SA has been announced by A. G. Chandler, president. Headquarters of the export-import firm are at 3 Rue de la Cite, Geneva, Switzerland. A native of Turkey, Mr. Durukal received a degree in petroleum engineering from the University of Oklahoma and a master's degree in petroleum engineering from the University of California. After service with Turkish Petroleum Corp., Mr. Durukal joined Royal Dutch-Shell in early 1957. He was head of the drilling department of N. V. Turkse Shell in Ankara, Turkey, until his recent appointment by Petroleum & Mining Equipment.

L. H. Nordenson

A. Durukal

Reed Roller Bit Appointments

Five top-level executives of the Reed Roller Bit Co.—J. A. Grundy, Wiley B. Noble, G. J. Gilbert, R. G. Stockton, and T. B. Ellis—have been given new appointments.

Mr. Grundy, formerly vice president, manufacturing, has been appointed operating vice president; vice president Noble, formerly head of engineering is now in a new executive liaison post; Mr. Gilbert has been appointed chief engineer; Mr. Stockton is now materials manager; and T. B. Ellis has been promoted to factory manager.

Top Changes At Stone & Webster

Directors of Stone & Webster Inc. have accepted the resignation of William T. Crawford as chairman, effective January 1, 1959. He will continue as a director. Whitney Stone, formerly president, was elected chairman and chief executive officer, and Richard N. Benjamin was elected president and a director. Mr. Benjamin had been president of Stone & Webster Service Corp.

Roots-Connersville Appointment

Glenn H. Crocker has been appointed general sales manager of Roots-Connersville Blower Division of Dresser Industries Inc., Connersville, Ind. He replaces W. W. Harris, recently resigned.

Stainless-Steel Unit

The Petreco Division of Petrolite Corp. has installed its first Electrofining unit of entirely stainless-steel construction. Installed in a large eastern refinery, the precipitation unit will be used to remove the slurry from an aluminum-chloride-catalyzed alkylation process.

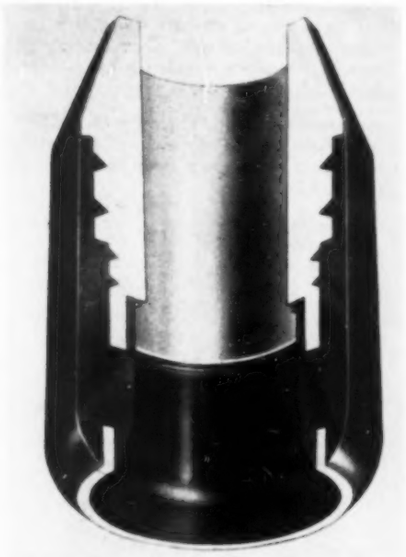
Electrofining Precipitator

To provide accurate pilot runs of close-to-operational treating capacities, Petreco Division of Petrolite Corp. has designed a portable Electrofining precipitator with a volumetric capacity of less than 60 gal.

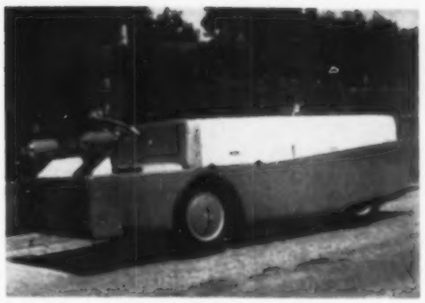
In a recent pilot test operation on the Gulf Coast, the stream from a 600-mile West Texas natural-gasoline pipeline was treated. Treatment with the portable Petreco Electrofining precipitator reduced the iron content to 5 ppm from 7,500 ppm.

Interchangeable Mandrel

Mission Manufacturing Co. has introduced the Mark 1 cup swab, a heavy-duty positive-displacement-type swab with a non-wearing steel core and utilizing the same mandrel as the standard Mission E-Z swabs. It is built to handle fluid loads of from 1,200 ft to the heaviest loads encountered.



Mark 1 cup showing the solid-steel reinforcing core.



A streamlined, power-packed, self-propelled utility unit designed by Stewart & Stevenson Services Inc. for ground service to jet aircraft can be applied to many uses in the oil industry. The vehicle is expected to have wide use in pipeline operations as a mobile generator unit. In oil and chemical processing plants, it is easily adaptable to a dependable form of emergency, standby electric power.

Hydraulic Power-Tool Catalog

W-S Fittings Works, Forge and Fittings Division, H. K. Porter Co Inc., Roselle, N. J., has published a new *Hydraulic Power Tool Catalog AS-58* covering independent pump hydraudic jacks, single- and double-plunger hand pumps, and double-acting air-engine pumps.

Schlumberger Appointments

Schlumberger Well Surveying Corp. of Houston has announced the recent appointment and promotion of five men: John T. Foster will be senior sales engineer at Houston; W. H. Throop, location manager at Monroe, La.; Lee Petty, has been promoted to district manager at Corpus Christi; A. Kane is senior sales engineer at Los Angeles; and J. S. Baldry is sales engineer at Abilene, Texas.

Portable power plants like the unit shown here are designed and manufactured by Stewart & Stevenson Services Inc. to provide electric power for lighting and general-purpose use at the camp sites overseas of drilling rigs in Turkey and Somaliland.

Buys Bowen Stores

T. M. Johnston, president of the newly formed Service Oil Tool Co., has purchased the S. R. Bowen Division fishing-tool stores. Mr. Johnston was formerly executive vice president for Johnston Testers Inc. of Houston and Los Angeles.

Bradford Supply Moves

The Bradford Supply Co. moved its general sales offices to Tulsa, on January 1; F. E. Foster, general sales manager, and Carl H. Peterson, administrative assistant. Administrative headquarters will remain in Bradford, Pa. In addition to representing over 80 of the oil industry's foremost suppliers, Bradford also offers a complete water-flood consulting and engineering service.

Double-Reduction Axles

Three new two-speed double-reduction type rear axles for heavy-duty International trucks have been announced by the motor-truck division of International Harvester Co. All are suitable for highway or off-highway operation.

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Hydro-Test

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Exhibit located in block 202 north area.

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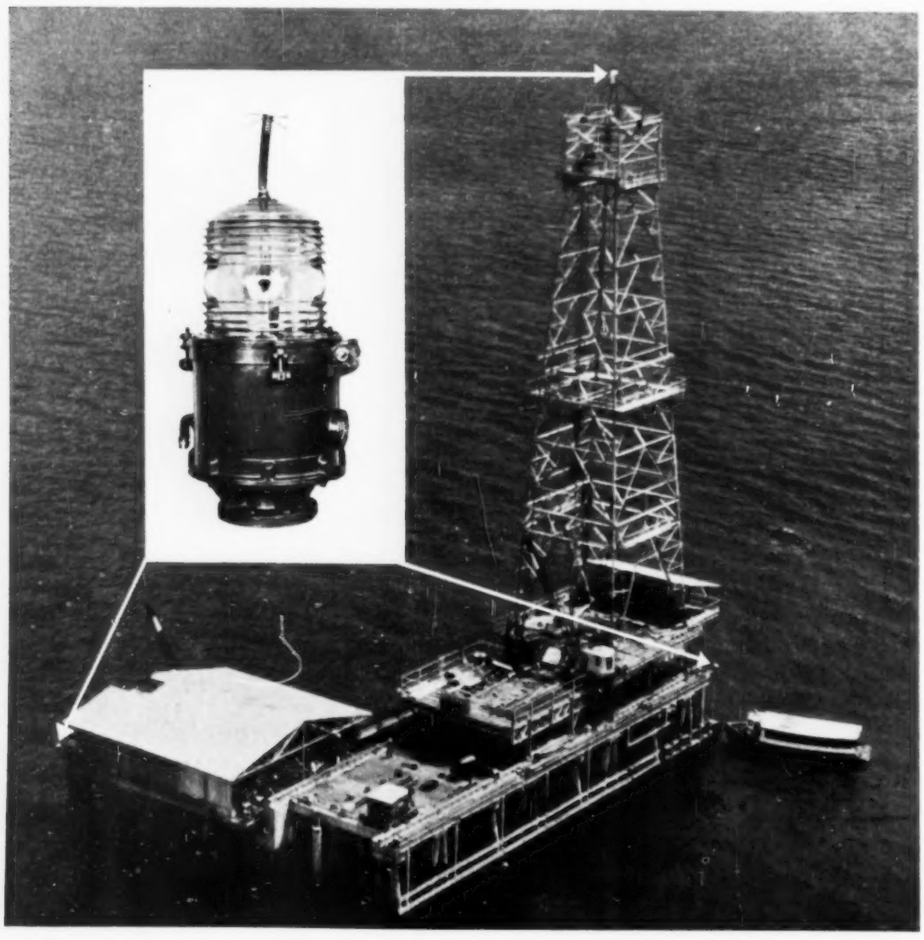

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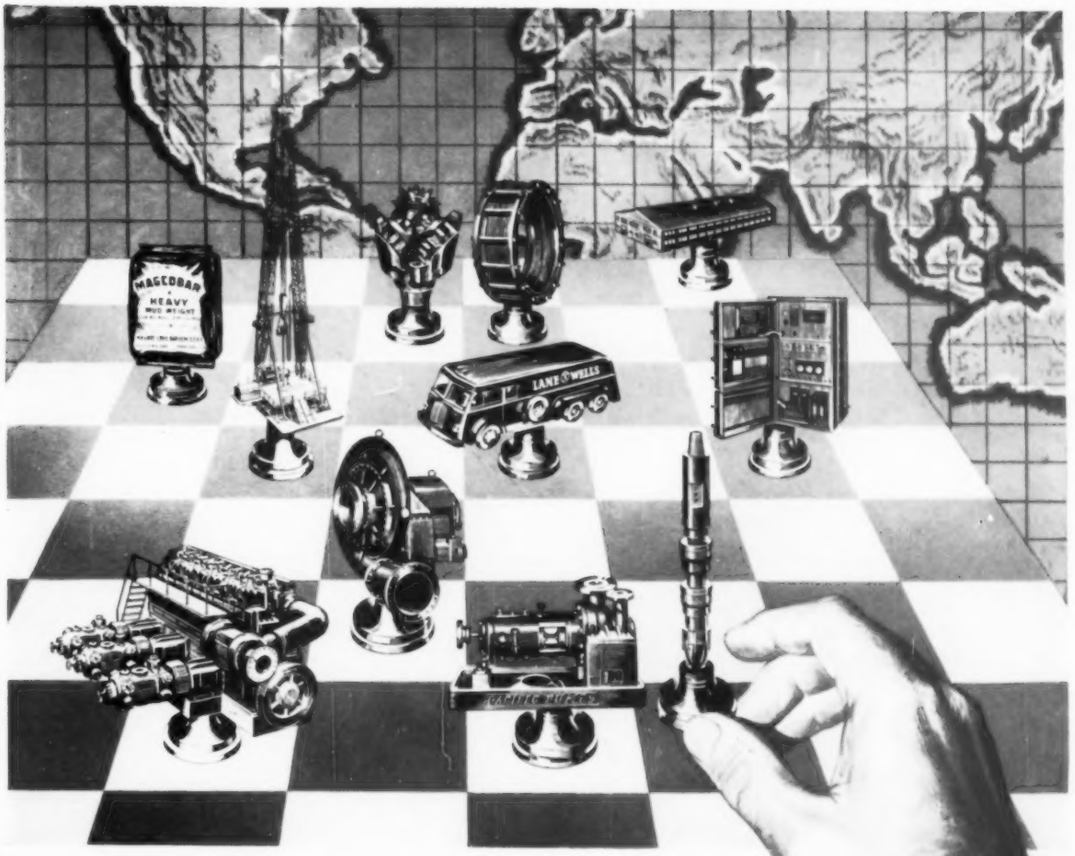

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